TECHNOLOGY DEPT.

the OIL AND GAS JOURNAL

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DETROIT

Economy is NOT a mere word with Franks Servicing Units

HERE'S A FRANKS UNIT ON ITS FOURTH TRUCK

The Franks truck-motor-driven servicing unit pictured in this ad was purchased new Aug. 31, 1934 by a major oil company. It was transferred to a second new truck, with minimum of overhaul, in 1940; to a third new truck, with no major overhaul, in 1945; and this year (1950) to a fourth new truck.

The owner reports it has averaged 245 tubing and rod jobs per year handling approximately 735,000 feet of rods and 735,000 feet of tubing each of its 16 years.

This is what we at Franks mean by ECONOMICAL. Not only will Franks truck-motor-driven servicing units give years of service beyond any normal concept of heavy duty oil field equipment life, but it does not become obsolete, outmoded, nor worn out . . . if it were any of these three, no major operator would give it the consideration of a new truck.

Contractors, too, know Franks units are the most economical; that they do more work, more easily; and that companies prefer having their wells serviced with a Franks unit, safely and economically. You cannot afford to buy until you've investigated Franks.

FRANKS MFG. CORP. WELL SERVICING AND DRILLING UNITS

"On the SPOT" FIELD SERVICE

Field service, too, is more than a word at Franks. Franks maintains "On the Spot" service centers at Casper, Compton, Great Bend, Mt. Vernon, Odessa, Kilgore, Houston, Alice and Tulsa, each complete with stocks of parts, factory trained personnel, shop facilities, and 24-hour service.

FRANKS MFG. CORP. WELL SERVICING AND DRILLING UNITS

FRANKS MFG. CORP.
3218, TULSA, OKLA.
Export Representative:
V. Simonson, 149 Broadway, New York, N. Y.

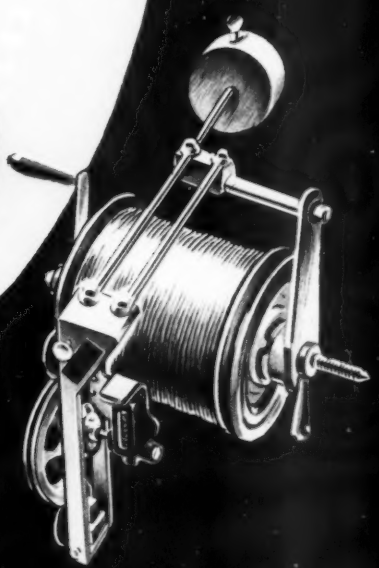
XUM

FOR ACCURATE DEPTHS COUNT ON HALLIBURTON

HOWCO measuring devices have been developed during the past 25 years to provide precision in the placement of cement under any and all conditions. Accurate beyond any other known method, they are accepted as the standard of exactness in determining depths wherever that factor is vital. For speed, simplicity and adaptability, oil operators the world over continue to *count on Halliburton* measuring devices *for accurate depths.*

HOWCO measuring devices are an essential part of your drilling equipment...useful every day in trimming your *"margin-for-error"* to a negligible "hair-line"! Let your HOWCO representative describe and recommend the type of HOWCO measuring equipment best suited for your problems...CALL HIM TODAY.

"There's no substitute for experience in oil well cementing"



HOWCO MEASURING DEVICES

HALLIBURTON OIL WELL CEMENTING COMPANY

DUNCAN OKLAHOMA

XUM

QUALITY?... YES!

QUANTITY?... YES!

VARIETY?... YES!

TAYLOR FORGE WELDING FITTINGS

U. S. RUBBER HOSE AND PACKING

BETHLEHEM STUDS AND NUTS

...mless pipe, tubing; Bethlehem Lap ...d and Beth-Co-Weld pipe; Bridgeport ... Co. condenser and exchanger tubes.

Refinery Stocks at Bethlehem Stores are BIG...NEW...UP-TO-THE-MINUTE

When you're after refinery supplies, the best, most convenient place to call is the Bethlehem Supply store. There's one in every refinery area . . . big, neat, stocked to the ceilings with the goods most commonly in demand.

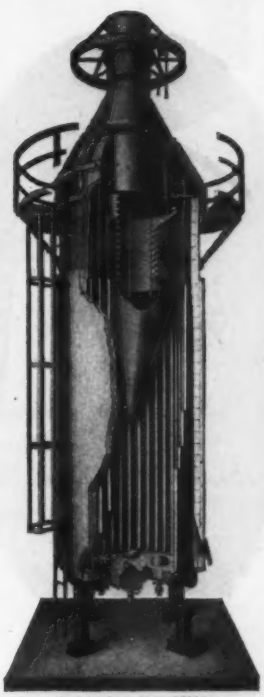
Studs and nuts, pipe and tubing, valves, fittings, hose and packing, tools, instruments . . . these and scores of other items are always available. Engineered products, such as pumps or furnaces, can be secured on short notice; and your job of selection is made easier by the services of Bethlehem's refinery sales personnel.

In refinery matters, let Bethlehem Supply be your "warehouse." It will save you trouble, time, and the cost of writing off obsolescent stocks. Just reach for the telephone — dial the nearest Bethlehem store. We'll do the rest.

O.I.C. VALVES

NORDSTROM PLUG VALVES

WORTHINGTON PUMPS



ISO-FLOW FURNACES

BETHLEHEM STEEL

BETHLEHEM SUPPLY COMPANY

General Offices: 21 E. Second Street, Tulsa, Okla.

Subsidiary of Bethlehem Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

HEADQUARTERS for REFINERY SUPPLIES

XUM

"Sacré Bleu", exclaimed LaSalle "such progress I've never seen"

To far-seeing business management it is apparent that the next half century will see the Southwest emerge as the greatest industrial area in the United States. Vast natural resources, assured low-cost power, temperate climate, and centrally located for low-cost distribution, this area offers management the geographical area ideal.

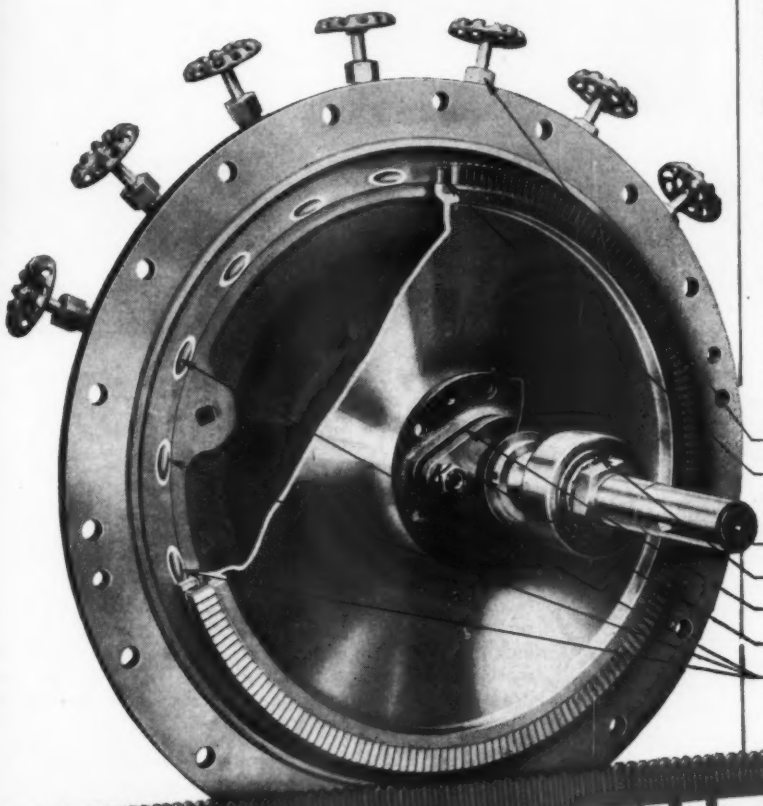
Brown & Root offers you experienced counsel, backed by more than thirty years of successful engineering and construction in the great Southwest. Their "know-how" may result in faster, more economical completion of your proposed project. A request will put Brown & Root plant-planning experts at your disposal.

BROWN & ROOT, Inc. Engineers • Constructors

No other steam turbine offers you

SUCH VERSATILE STEAM NOZZLE CONTROL

The larger number of hand valves you see on a Coppus Steam Turbine promises you greater operating economy. At least 60% of the steam nozzles can be individually controlled to give maximum steam pressure in steam chest . . . a guarantee of best water rates at any load. Maintenance economy, too, is assured by the hard chromium plating of the shaft at the stuffing box. It provides the best possible smooth, non-corrosive surface for packing rings.



7 hand valves for efficient partial load operation, (20" turbine shown)

2 row velocity-stage turbine wheel with stainless steel turbine buckets — statically and dynamically balanced

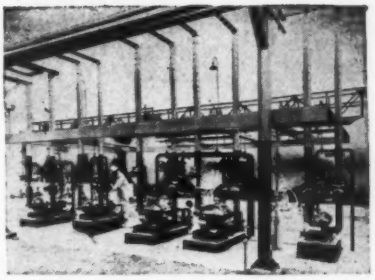
30-40 carbon steel shaft

Oversized double row deep grooved ball bearing

Stuffing box with metallic packing ring

Heavy chrome plating of shaft through stuffing box

3 nozzles always open



Coppus Steam Turbines, Type TF, driving chemical transfer pumps at Celanese Corporation of America's Chemcel Plant

Coppus Steam Turbines ranging from 150 hp down to fractional in 6 frame sizes

MAKE TURBINE DOLLARS GO FARTHER

Why waste money buying turbines with higher horsepower ratings than you need? The higher the horsepower rating, the higher the price. Save money by selecting the Coppus Turbine size closest to your requirements from 150 hp down to fractional. And when you do, you save operating and maintenance costs, too. That's what these other Coppus features are designed to do: exclusive pilot operated excess speed safety trip supplementing constant speed governor; choice of metallic or carbon ring packing assemblies. Designs available for back pressures up to 75 pounds; replaceable cartridge type bearing housings. For full details . . .

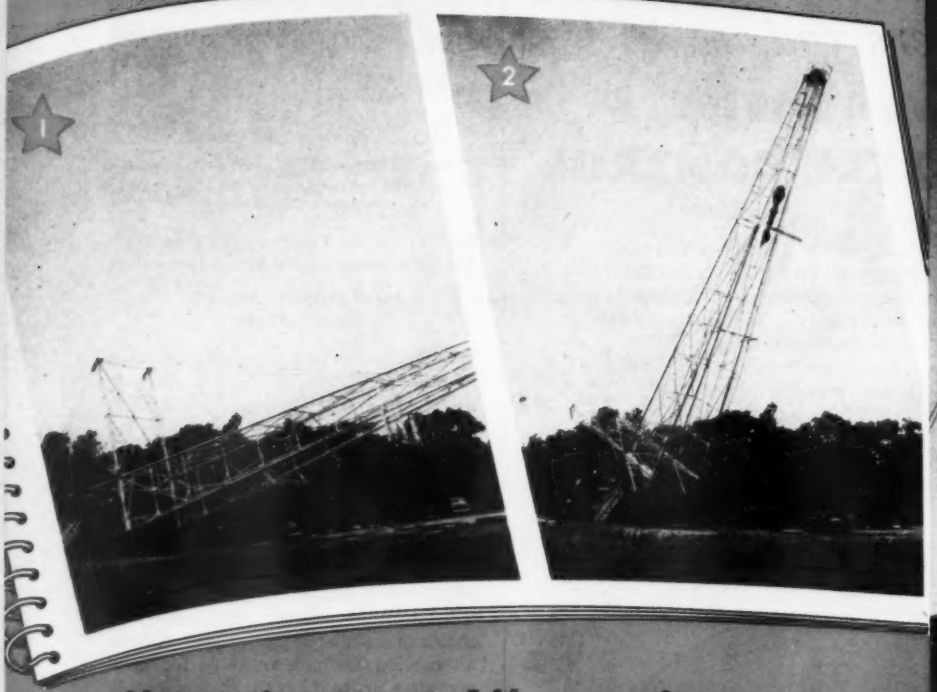
WRITE FOR BULLETIN 135

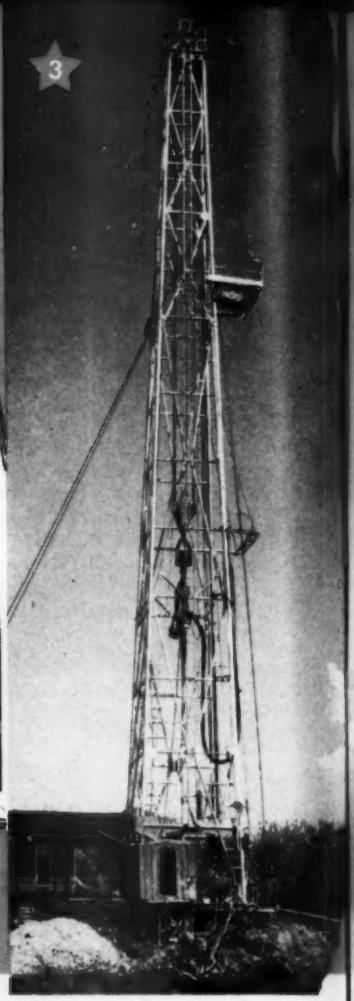
COPPUS ENGINEERING CORP.,
270 Park Avenue, Worcester 2, Mass.
Sales offices in THOMAS' REGISTER.

COPPUS "BLUE RIBBON" TURBINES

XUM

"Oilwell's" Improved 128 B Derrick . . .





"Engineered" to give you

Easier Raising-Greater Safety

NOW . . . "Oilwell" announces engineering refinements which make the new 128-B Portable Derrick better than ever. These improvements give you:

1 **EASIER ASSEMBLY**—The complete derrick is assembled at ground level and only one light gin-pole truck is necessary in handling the sections.

2 **REDUCED RAISING LOADS**—A new rigging method and transfer of pivot point from front to rear legs at approximately 23° reduces the peak raising load requirements.

3 **GREATER SAFETY**—The fact that the assembled derrick does not need to be lifted, plus reduced raising loads, offers a maximum of safety. Also during the raising operations the center of gravity never passes over the pivot point. This eliminates the necessity of snubbing the derrick into final position, which is always a hazardous operation that requires extra equipment.

In addition—you get all the field-proved advantages found in earlier "Oilwell" models, such as: (1) sealed tubular seamless steel construction, (2) easy-to-handle sections, joined by tight-fitting dowel-pin flanges, (3) six-sheave, center-pin crown block which distributes load equally to all four derrick legs, (4) adjustment facilities for aligning centerline of crown block with centerline of well, (5) adjustable pipe rack with positive locking safety fingers, (6) gin poles which form draw-works and engine cover frame and (7) fast line from draw works running inside the derrick with traveling block in view at all times.

Ask . . . your nearest "Oilwell" Representative for complete information on the 128-B Portable Derrick.

OIL WELL SUPPLY COMPANY

Branches Serving All Oil Fields

Executive Office—DALLAS, TEXAS
Export Division Office—
30 ROCKEFELLER PLAZA
NEW YORK 20, N. Y.

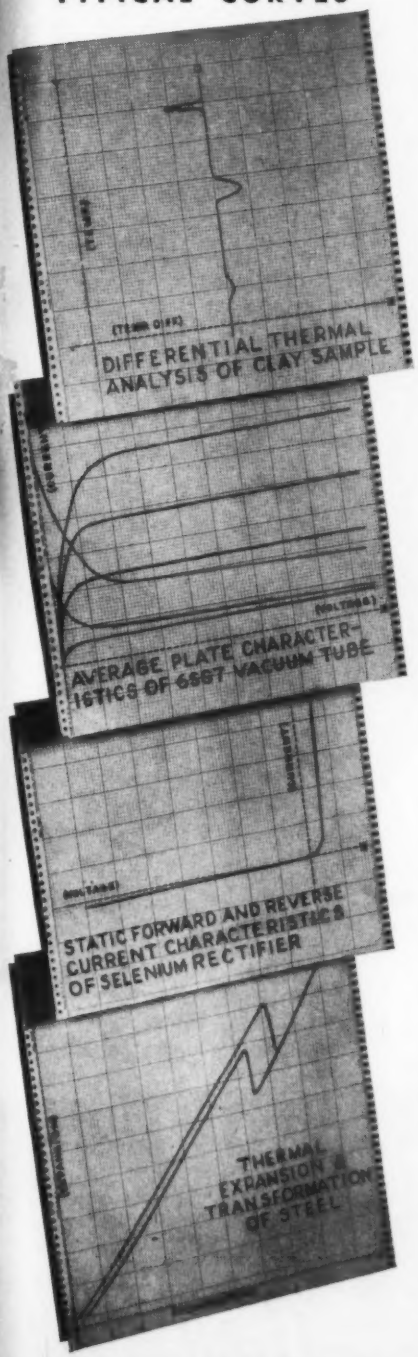
Division Offices—CASPER, WYOMING
COLUMBUS, OHIO . . . DALLAS, TEXAS
HOUSTON, TEXAS . . . TULSA, OKLAHOMA
LOS ANGELES, CALIFORNIA

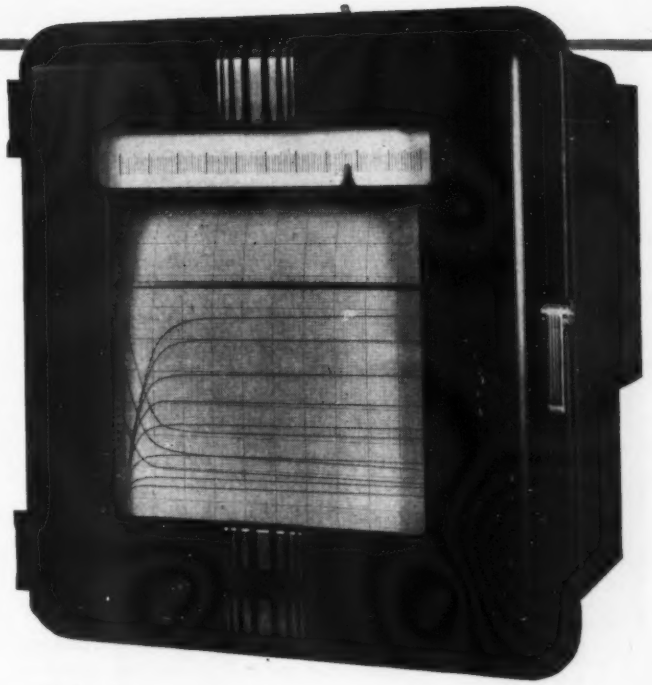
USS "OILWELL" TRADE MARK

UNITED STATES STEEL

Now you can plot X vs. Y... automatically

TYPICAL CURVES


DIFFERENTIAL THERMAL ANALYSIS OF CLAY SAMPLE
AVERAGE PLATE CHARACTERISTICS OF 6SS7 VACUUM TUBE
STATIC FORWARD AND REVERSE CURRENT CHARACTERISTICS OF SELENIUM RECTIFIER
THERMAL EXPANSION & TRANSFORMATION OF STEEL



with the

New Speedomax 2-Function Recorder

Boon to engineering and research laboratories, this new Speedomax Recorder automatically plots a continuous, accurate curve showing the relationship between any two variables brought to the instrument in the form of d-c signals. Gone are those hours of tedious compilation and point-by-point plotting of data.

Just glance at these typical curves and note the instrument's remarkable versatility. Its big 10″ chart provides remarkably complete detail. Potential applications are as broad as a researcher's imagination.

This new X-Y Recorder has two electronic circuits, one for each function. X corresponds to horizontal pen travel; Y to up-and-down movement of the chart. Input voltage can be as low as 2.5 mv for X; 10 mv for Y. Response time is amply fast—just 2 sec for full scale pen travel (X); 4 sec per 10″ of chart (Y).

For details, send for Folder EM9-420(1). Write us at 4959 Stenton Ave., Philadelphia 44, Pa.

Jrl Ad EM9-420(2)

MEASURING INSTRUMENTS TELEMETERS AUTOMATIC CONTROLS HEAT-TREATING FURNACES

LEEDS & NORTHRUP CO.

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910, at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1950.

XUM

Stabilize YOUR DRILL STRING

- **INCREASE DRILLING WEIGHTS**
- **ELIMINATE DRILL PIPE WHIP**
- **MAKE FULL GAGE HOLE**
- **ELIMINATE BIT WOBBLE**

When the new Security Reamer-Stabilizer is run between drill collars, it not only insures clean full gage hole, but provides unexcelled drill string stabilization. With three barrel-shaped cutters contacting over a third of the wall circumference at all times, this new tool acts as a large roller bearing, absorbing and transmitting to the formation all forces tending to start drill stem whip and rock bit gyration.

The result of running the Security Reamer-Stabilizer is a smooth drilling string to which weight may be added *without* the usual undesirable effects. Drilling can proceed at a faster rate and the time for the entire drilling operation is reduced appreciably.

LOOK AT THESE NEW FEATURES

- **Extra rugged body sections throughout.**
- **Heavy ribs between cutters give maximum strength in torque and bending.**
- **Barrel-shaped cutters provide proper bearing surfaces for efficient stabilization.**
- **Open pockets and directed return circulation keep cutters clean.**
- **Cutters retained in body by exclusive locking device.**

Ask your Security Field Representative about this new Reamer-Stabilizer.

Security

HOLE OPENER

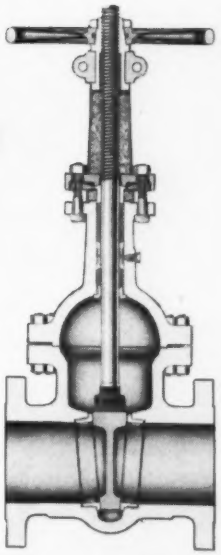
ROCK BITS • CORING BITS • REAMERS • CASING SCRAPERS • SECURALOY

SECURITY ENGINEERING CO., INC.

ONE OF THE DRESSER INDUSTRIES

Main Office: Whittier, California
Branches in all major producing areas.
Export Office: Chanin Building, New York City

For complete selection...Better service ...Get everything from CRANE



No. 33X, 300-Pound Steel Gate. For oil and oil vapor up to 1100° F. Exelloy to Exelloy seating. Sizes: 1½ to 24 inches.

STEEL VALVES FOR LONG SERVICE...EASY OPERATION

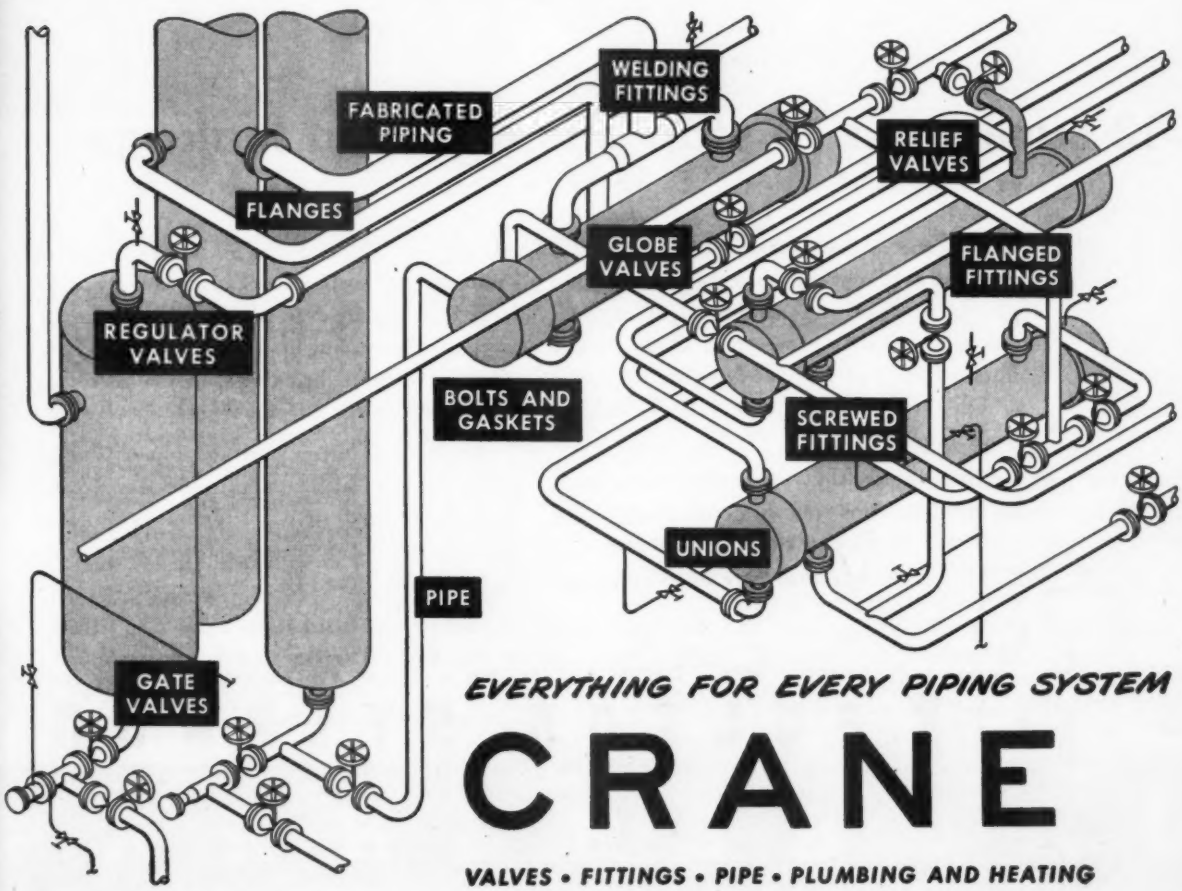
No matter how tough or how precise your service requirements ... Crane Cast Steel Wedge Gates will meet them. Crane Quality construction assures highest resistance to pipe line strains, pressure variations, and extreme changes in temperature.

These valves are as easy to operate as they are to keep at peak efficiency. Closely-guided solid wedge disc seats accurately and smoothly; prevents drag and wear on seating surfaces. Side strain on stem is eliminated by Crane flexible T-head and disc-stem connection. Ball-type gland maintains even pressure on packing, avoids binding on stem.

Choose Crane Cast Steel Gates for dependable service. Regularly available in pressure classes up to 1500 pounds, for temperatures up to 1100° F. See your No. 49 Crane Catalog.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

ONE ORDER TO CRANE EQUIPS THIS VAPOR RECOVERY PROCESS UNIT, FOR EXAMPLE



EVERYTHING FOR EVERY PIPING SYSTEM

CRANE

VALVES • FITTINGS • PIPE • PLUMBING AND HEATING

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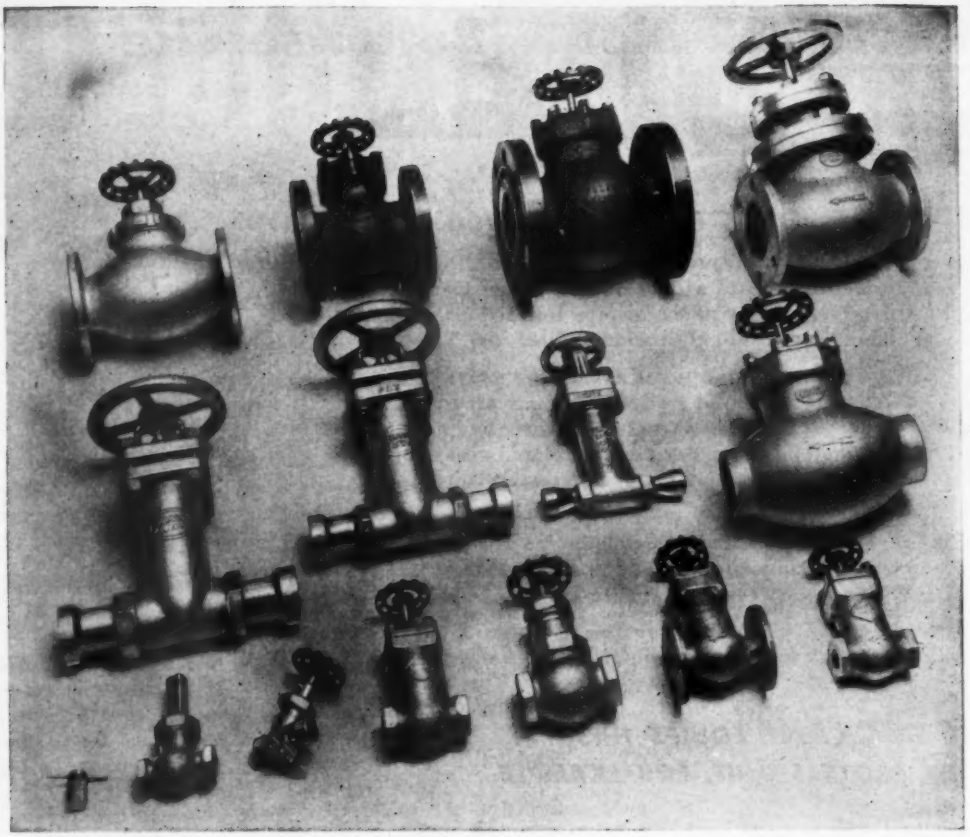


Showing a few of the many types of Sylphon Packless Valves available. Sizes range from 1/8" to 6". For vacuum service, No. 304-NV is ideal.

13 sure ways to stop gas or liquid leakage

● Any one of these Sylphon Packless Valves pictured here may be just what you need to prevent wastage of valuable liquids or gases—provide vacuum protection. Once they're installed on pipe lines carrying oil, gasoline, or other volatile liquids or vapors, leakage stops instantly!

What's more, they are added safeguards for you and your equipment against fire, explosion or other damage.

Sylphon Packless Valves are completely dependable because a seamless Sylphon metal bellows replaces customary packing. It eliminates even tiniest leaks that might seep past the stuffing box of an ordinary packed-type valve—seals the valve stem against corrosive, dangerous or inflammable liquids or gases.

Available in many sizes and types. Widely used in chemical plants, oil refineries, power plants, aboard ships. Ideal as standard equipment. For complete information, write for Bulletin RO-813.

FS

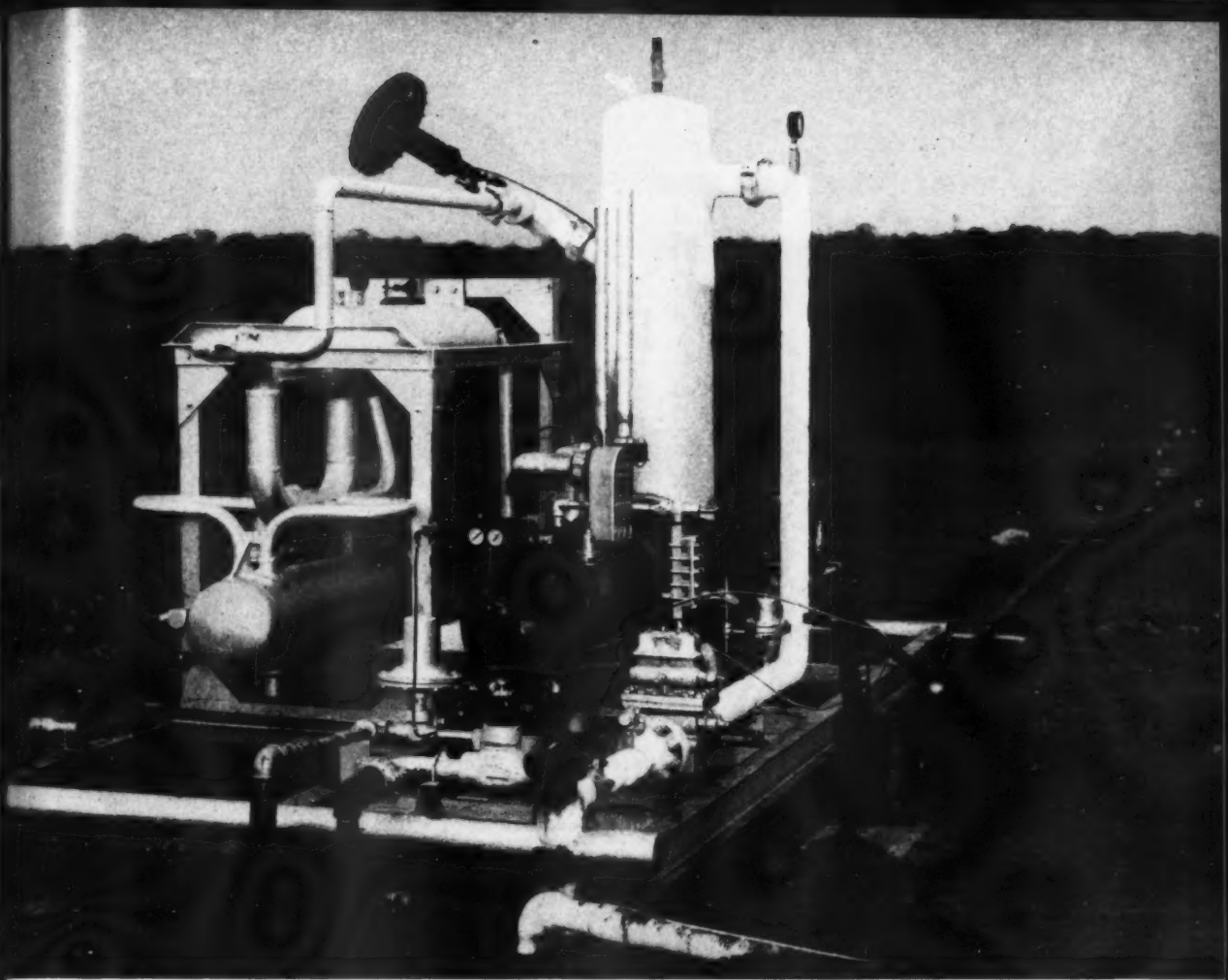
Temperature Controls • Bellows Devices • Bellows Assemblies

FULTON SYLPHON
DIVISION

FIRST WITH BELLOWS

ROBERTSHAW-FULTON CONTROLS CO., KNOXVILLE 4, TENN.

Canadian Representatives, Darling Brothers, Montreal



INCREASE YOUR PROFITS
by Increasing Condensate Recovery with PARKERSBURG HYRECO

Every Parkersburg Hyreco Processing Unit in operation today is a revenue producer. By increasing condensate recovery and lowering well operating costs (Hyreco eliminates heaters, and their operating and maintenance expense) they are producing extra profits for gas well owners.

You can start making these extra profits from your own high pressure gas wells, within 40 to 60 days after installing a Hyreco. You start saving heater operating cost and the expense of downtime due to line freezing the day the Hyreco goes into service.

Regardless of how efficient your conventional well head hook-ups may be, the Parkersburg Hyreco will increase condensate recovery. It is the only unit of its kind backed by a long record of field testing to prove this performance.

Be sure to investigate the Parkersburg Hyreco. Ask your Parkersburg Representative for facts about this revenue producer. Write for Bulletin HR-650.

5019

PARKERSBURG

RIG & REEL COMPANY • Parkersburg, West Virginia

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JONES SUCKER ROD COUPLINGS

To provide enduring trouble-free service, Jones sucker rod couplings are produced of selected steels to suit conditions under which they are used. Accurate alignment of face and threads is assured by precision threading, line reaming, tapping through the entire length in one operation, finishing within extremely close tolerances and inspecting. Threads, faces and shoulders of pins and couplings mate perfectly. Shocks, vibrations, load strains and stresses are resisted successfully. Case hardened and ground couplings offer a fine tough core to resist fatigue and a hard smooth wearing surface to withstand abrasion.

"LOOK FOR THE GREEN RODS"

JONES

SUCKER RODS

*Simplifying specification and ordering—the new Jones Catalog helps you get the right couplings for pumping requirements. Your copy will be sent on request.

***THE S. M. JONES COMPANY**
Division of Buffalo-Eclipse Corporation
General Office and Factory: TOLEDO, OHIO
Sales Office: Kennedy Building, Tulsa, Okla.
Export Sales Office: Buffalo International Corp.
50 Church Street, N. Y. C.

More freedom for business action-

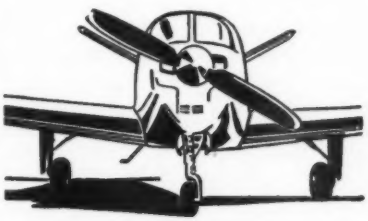
with a company-owned

Beechcraft

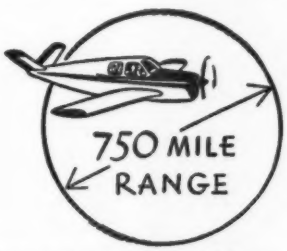
You make more calls when you cruise at a 170-mile clip. No wasted time, no wasted effort. Travel *means* more! Minutes in the air pay you back with hours of productive time.

You get to *where* the business is in luxurious comfort. Room to spare for four big people in the smartly tailored, quiet Beechcraft Bonanza cabin. Maximum 5-way visibility.

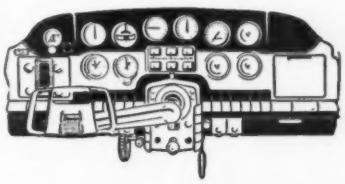
You travel in safety. The B35 Beechcraft Bonanza is extra rugged, withstanding shock and stress tests far surpassing CAA requirements. All-metal construction.



You get top performance. Flight characteristics make it exceptionally easy to handle. Speed, range and fuel economy unexcelled! Wide, sturdy landing gear smooths out short, rough-field landings.



You get amazing efficiency. At cruising, the Beechcraft Bonanza uses only 56% of the engine's rated take-off horsepower! And fuel consumption is low—amounting to only 9.5 gallons per hour!



You enjoy many extra features. For instance, a functionally designed instrument panel, highly efficient . . . but handsome, too! Touches of luxurious comfort everywhere—even to coat hangers, ash trays, map pockets!

Get all the facts! There are hundreds more . . . about the extra advantages of the new Model B35 Beechcraft Bonanza. Check with your nearest Beechcraft distributor or dealer. or write for complete information on your company letterhead to Beech Aircraft Corporation, Wichita, Kansas, U.S.A.

Top speed, 184 mph
Cruising speed, 170 mph
Range, 750 miles
Fuel economy, 9.5 gph

Beechcraft
BONANZA

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

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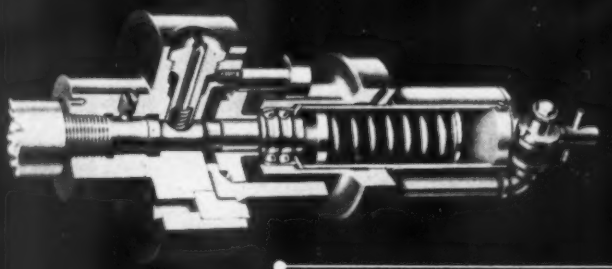
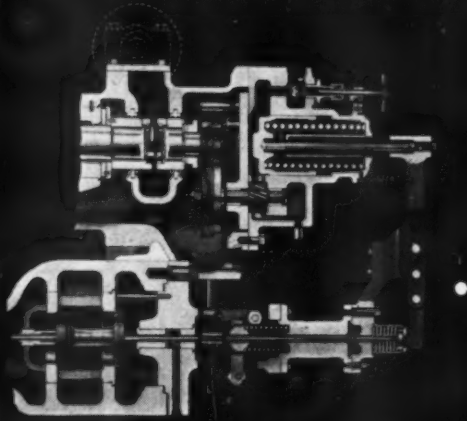
YOU CAN BE **SURE**.. IF IT'S

Westinghouse



FOR CLOSE-LIMIT SPEED CONTROL (6-8%)

The Standard Shaft-Type Governor is mounted on the turbine shaft and protected by a sturdy cast-iron housing, able to take a man's weight. This centrifugal-weight governor automatically positions the steam admission valve to control turbine speed within close limits—between 6 and 8 percent speed regulation. When equipped with a hand speed changer, this governor permits speed adjustment up to 20 percent of the rated speed.

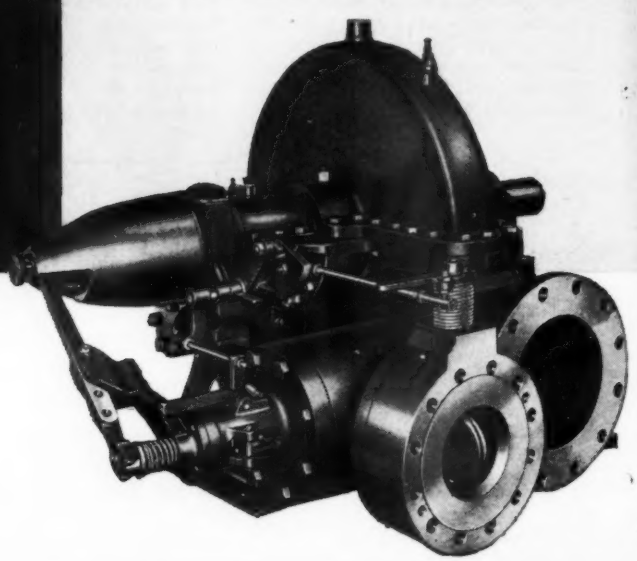


FOR VARIABLE-SPEED APPLICATIONS (6%)

The Hydraulic-Orifice Governor provides a 3-to-1 maximum speed adjustment and a speed regulation of 6 percent. The hydraulic-orifice type is particularly suited for variable-speed applications, such as drives for fans, blowers and compressors. Oil pressure for governing and lubrication is supplied by a shaft-driven, gear-type pump.

FOR WIDE-RANGE PRECISION CONTROL (4%)

The Vertical Oil-Relay Governor provides the quality of speed regulation required for generator drives or other applications requiring close regulation. It also provides the power required to handle large steam flows. It affords speed regulation of 4 percent and may be provided with a maximum speed adjustment of 3-to-1 with integral pump . . . and higher with a separate motor-driven pump. It is a frictionless centrifugal-weight, speed-responsive element combined with an oil pump and servomotor. With speed-compensating parts this governor is ideal for paper-machine drives.



XUM

Now Standardized!

PRECISION CONTROL for all Speed Problems

Here's the kind of governor standardization that "pays off". Now you can economically solve all speed-control problems with only three basic governors.

The expense of special engineering is eliminated. Advanced design now gives you an unusual degree of flexibility . . . with precise speed control for all steam conditions. Results? First costs are lower—shipments are quicker—spare-parts inventory is reduced.

Designs for three basic classes of steam conditions, three wheel sizes, and three types of governors provide, in effect, twenty-seven standard variations to cover a wide range of applications. What's more, Type E governors can meet a limitless number of special requirements with optional accessories. Westinghouse's wide experience in all industry enables you to realize the benefits of this progressive standardization.

Simplicity and flexibility of governors is but one of the outstanding advantages of the Type E turbine. Consider these important Westinghouse maintenance-saving features . . . Dual Protection . . . Weather Protection . . . Centerline Support . . . a Rugged Governor Housing. They're your assurance of extra reliability, safety, and econ omy. Ratings are available from 5 to 1,500 hp.

There's a Westinghouse Steam Specialist near you who will be glad to help with your speed-control problems. A complete study of your power application will be made without obligation. These recommendations may point the way to substantial savings in power costs, in greatly increased production. Call your nearest Westinghouse office or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

Ask for Type E Turbine Book, B-3896.

J-50515

Westinghouse
TYPE E
Turbines

XUM

"If you are going to maintain private enterprise . . .

HONORABLE PAUL G. HOFFMAN
Administrator,
Economic Co-operation Administration

"If you are going to maintain private enterprise in the United States, you must have private savings. There is no substitute for them. If America ever loses the habit of thrift, and stops saving, the funds for private enterprise will cease."

More than 8,000,000 Americans . . . in 21,000 companies are enjoying the habit of thrift. By systematic purchase of U. S. Savings Bonds through the Payroll Savings Plan they are building their independence . . . creating a fund for the education of their children . . . putting aside money for a home or working towards other objectives that contribute to our national economy and the preservation of private enterprise.

Employes are not the only beneficiaries of the Payroll Savings Plan. As employee participation in the plan increases, absenteeism and turnover go down and production goes up, because bond buyers are steadier, more careful workers. That is not theory—it is the experience of companies that get behind the Payroll Savings Plan.

There's a national benefit, too. Think of the backlog of purchasing power being built up, month after month, by more than 8,000,000 workers!

If you are not affording your employes an opportunity to build a future for themselves, their company and their country through participation in the Payroll Savings Plan, get in touch with your State Director, U. S. Treasury Department, Savings Bond Division. He will be glad to provide application cards, promotional material and as much personal help as you need to install and build up your Payroll Savings Plan.

The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the G. M. Basford Company and

THE OIL AND GAS JOURNAL
Tulsa 1, Oklahoma

Guaranteed Yield

100 BARRELS OF MUD PER TON OF CLAY

Drillers in South America, Arabia, Canada, Mid-Continent, Gulf Coast, California, in short, the world over, use Wyo-Jel for keeping mud fluid. They like the fine particle size, the excellent suspending qualities and ease of mixing.

Wyo-Jel absorbs tremendous quantities of water and has a guaranteed yield of 100 barrels of mud per ton of clay, at 15 Centipoise Viscosity, with minimum water loss.

Use Wyo-Jel, the ideal drilling mud material . . . a pure Wyoming Bentonite.

WYO-JEL

The Ideal Drilling Mud Material

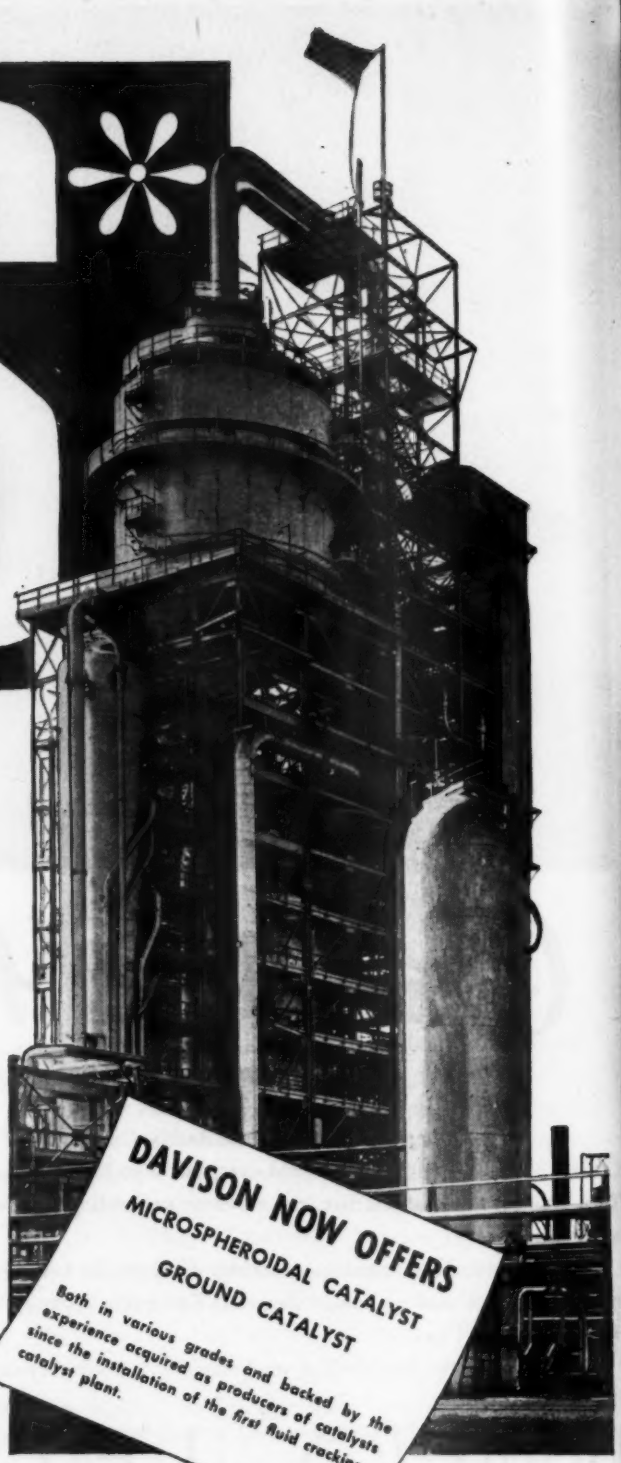
THE WYODAK CHEMICAL DIVISION
of THE FEDERAL FOUNDRY SUPPLY COMPANY
4600 East 71st St., Cleveland 5, Ohio

THE WYODAK CHEMICAL DIVISION
4599 Pacific Blvd., Los Angeles (Vernon), Calif.

EXPORT REPRESENTATIVE
HOLLAND W. SMITH, 43 E. 43rd St., New York 17, N. Y.

XUM

M·S*



DAVISON MICROSPHEROIDAL CATALYST

In order to serve the petroleum industry's needs for synthetic fluid type cracking catalyst in microspheroidal form, Davison is installing spray drying facilities in its Cincinnati, Ohio catalyst plant. The installation is scheduled for completion by October, 1950.

The new equipment includes the largest spray drying chamber yet installed for the purpose of making petroleum cracking catalyst. It will be capable of producing several grades of catalyst in microspheroidal form, each having unusually favorable particle size distribution.

The chamber will be built entirely of stainless steel; and with other special processing equipment, the catalyst produced will equal the high standards of quality inherent in all Davison products.

Now, your requirements for fluid synthetic cracking catalyst can be supplied by Davison in either microspheroidal or ground form and you can depend on Davison for reliable and cooperative service.

DAVISON NOW OFFERS

MICROSPHEROIDAL CATALYST

GROUND CATALYST

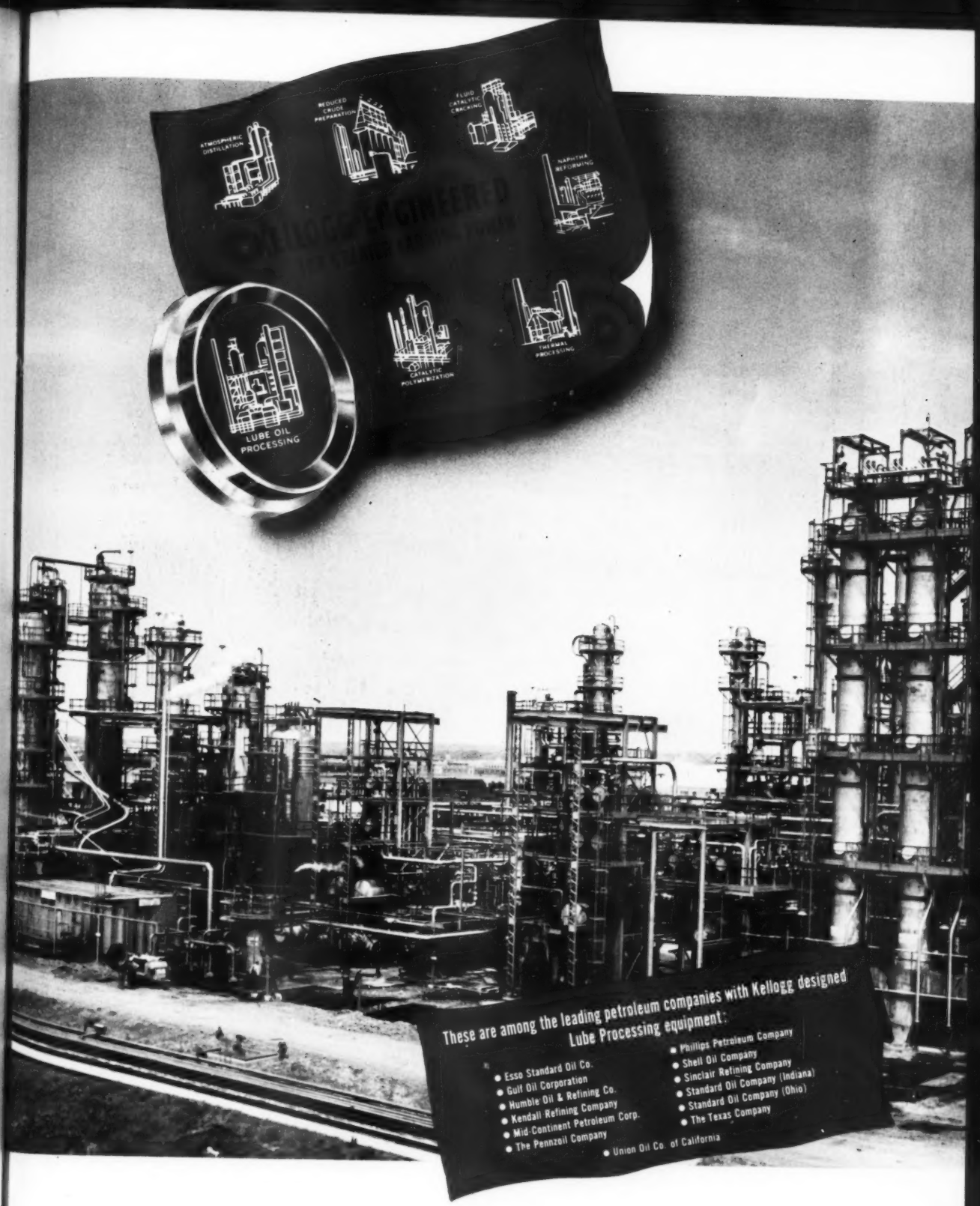
Both in various grades and backed by the experience acquired as producers of catalysts since the installation of the first fluid cracking catalyst plant.

* T.M. T.D.C.C.

PROGRESS THROUGH CHEMISTRY

THE DAVISON CHEMICAL CORPORATION

Baltimore 3, Maryland



Kellogg-designed lube facilities have a total charge capacity of more than 100,000 barrels per day!

XUM

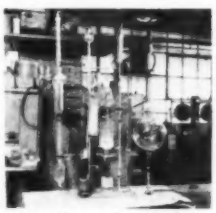
Yes! More than 35 million barrels of lube stocks are charged to Kellogg units each year!

FROM Pennsylvania's select crude to the Middle East's highly asphaltic stock, Kellogg's lubricating oil units are used to process virtually every type of feed. From single-unit propane deasphalters to entire lube plants, including everything from vacuum towers to barrelhouse facilities, Kellogg's experience is complete.

The pictured plant illustrates the unusual conversion of a surplus wartime alkylation-isomerization unit into a modern five-step plant for the production of high quality lubes. Today this plant is considered among the most modern and efficient in the world.

Kellogg offers refiners unduplicated experience in designing lube oil facilities, extending back over more than two decades, and now including the broadest choice of lube oil processes.

ENGINEERING HAS MARKED THE ADVANCES IN LUBE OIL REFINING!



Both lube oil specifications and lube refining economics have been subjected to extremely close scrutiny in recent years. Research by oil companies, pinpointing specifically-desired product qualities, has set standards that design engineers have worked to match through improved equipment. Kellogg engineers have contributed much to this progress, bringing forth in a comparatively short space of time the Tower method of deasphalting, the water rejection principle for counter-current solvent extraction, propane fractionation, wax de-oiling and improvement in vacuum fractionating efficiency which enables refiners to make extremely narrow cuts at low cost.

IT TAKES ALL SEVEN TO PRODUCE GREATER EARNING POWER . . .

1 THE DEVELOPMENT "TOOLS"
—laboratories, pilot plants and recognized specialists to prove and improve processing and equipment ideas.

3 SPECIALISTS IN EVERY PHASE
of design engineering due to the completeness of Kellogg's engineering staff.

4 SPECIALIZED BUYERS
backed by the cumulative buying power of the largest company in the business.

5 COMPLETE FABRICATING FACILITIES
to make schedule deadlines and to develop workable "firsts" in refinery equipment.

6 CONSTRUCTION KNOW-HOW
acquired in completing hundreds of major jobs, plus an ample supply of the proper tools, and the constant development of new money-and-time-saving methods on the construction lot.

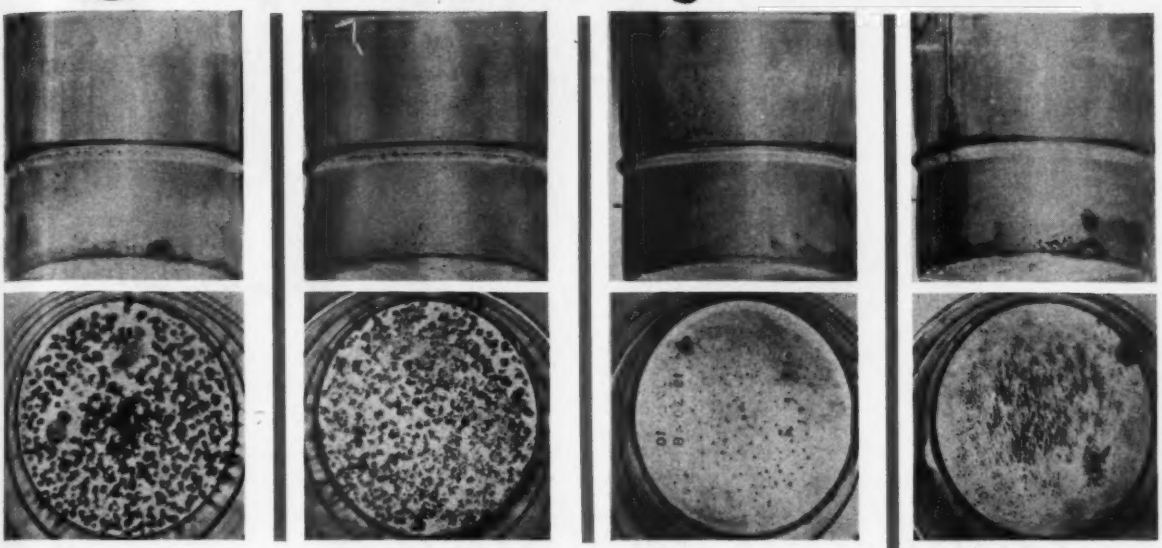
7 PRACTICAL OPERATING COUNSEL
on all design and construction, achieved through practical operating men working as an integral part of the company.

2. PROCESS ENGINEERING
by three distinct groups of specialists—the overall sequence planners, the specific process designers and the development engineers. The work of the first two groups is increasingly apparent in the new plants that continue to rise on the industrial landscape. The development engineer makes "headlines" with new processes, too, and Kellogg's development people have had their share. But many of their contributions to more economical processing go unheralded, although they are woven in to each new project —a new method of stripping here, a new method of introducing catalyst there, a double-function tower or furnace in another facility. Hidden as details of large over-all plans, these daily advances in refining efficiency are reflected over the years in improved earnings for refiners.

. . . AND ONLY KELLOGG HAS ALL SEVEN!

The M. W. Kellogg Company, (a subsidiary of Pullman Incorporated), New York, Jersey City, Los Angeles, Tulsa, Houston, Toronto, London, Paris

SANTOLENE C STOPS CORROSION
in stored drums of gasoline and fuel oil



EFFECTIVENESS OF SANTOLENE C is seen in these views of drums, which contained No. 2 fuel oil, used in a static storage test. Even with such small concentrations as 100 parts per million, Santolene C prevented corrosion pitting in the metal. Left to right, drums illustrated contained the following concentrations of Santolene C: 0 ppm.; 20 ppm.; 40 ppm.; 100 ppm. Visual inspection of these drums shows much greater contrast in favor of Santolene C than is possible in these unretouched photographs.

Proof that Monsanto Santolene C is effective in halting corrosion is found in a static storage experiment during which both gasoline and fuel oil were held in black iron drums for four months.

With concentrations as low as 100 parts per million in fuel oil, Santolene C held corrosion in check so effectively that the small amount formed was wiped away easily, leaving a clean metal surface that was free from pitting. Drums not protected by Santolene C showed corrosion that was firmly attached and which left definite depressions in the metal. A similar static storage test with gasoline brought equally gratifying results with even lower concentrations of Santolene C.

The possibility of corrosion is much greater in static tests, such as those to which Santolene C was subjected, than in dynamic tests.

Santolene C is an *effective* and *economical* way to stop corrosion in pipelines and tanks used for light petroleum products. Santolene C will give your fuel oil and gasoline qualities appreciated by users . . . qualities to win new customers for you. For further information on Monsanto Santolene C, mail the coupon.
MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1745-J South Second Street, St. Louis 4, Missouri.

Santolene: Reg. U. S. Pat. Off.

MONSANTO
CHEMICALS AND PLASTICS

MONSANTO CHEMICAL COMPANY
Organic Chemicals Division
1745-J South Second Street, St. Louis 4, Missouri

Please send information on Monsanto Santolene C.

Name.....Title.....
Company.....
Street.....
City.....Zone.....State.....

SERVING INDUSTRY . . . WHICH SERVES MANKIND

XUM

Built and Installed
BY PEOPLE WHO KNOW HOW

Let's be quite frank about what it takes to build a completely satisfactory, long-lasting Well Water System. As an almost entirely underground construction job, there must be a lot of know how; skill and experience gained over a long period of years in the building of thousands of Well Water Systems, otherwise many costly errors may be made.

In all the world there is no firm that equals Layne in skill; none that has had so much experience and none that is known to be so successful. Layne has built many successful systems where others have failed, proving that skill was the needed factor.

Layne constructs perhaps more big Well Water Systems than any other firm in the Nation. In addition to skill, Layne can offer the finest types of equipment, some of which they build for their exclusive use.

If you want helpful information on a water supply problem, you may call on Layne without obligation. For latest catalogs, bulletins, etc., address

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

NEW!—just off of the press—a bulletin on Layne Short Coupled Service Pumps, showing many diagrams of application for circulating and process pumping, lake and river intakes, drainage, line boosters and de-watering uses. Write for your copy today.

LAYNE ASSOCIATED COMPANIES

ASSOCIATED COMPANIES—Layne-Arkansas Co., Stuttgart, Ark. ★ Layne-Atlantic Co., Norfolk, Va. ★ Layne-Central Co., Memphis, Tenn. ★ Layne-Northern Co., Mishawaka, Ind. ★ Layne-Louisiana Co., Lake Charles, La. ★ Louisiana Well Co., Monroe, La. ★ Layne-New York Co., New York City ★ Layne-Northwest Co., Milwaukee, Wis. ★ Layne-Ohio Co., Columbus, Ohio ★ Layne-Pacific, Inc., Seattle, Wash. ★ The Layne-Texas Co., Ltd., Houston, Tex. ★ Layne-Western Co., Kansas City, Mo. ★ Layne-Minnesota Co., Minneapolis, Minn. ★ International Water Corp., Pittsburgh, Pa. ★ International Water Supply, Ltd., London, Ont. ★ Layne-Hispano Americana, S.A., Mexico, D. F. ★ General Filter Company, Ames, Iowa.

LAYNE
WELL WATER SYSTEMS
VERTICAL *Turbine* PUMPS

Save Time Save Travel

with this one stop supply service

80 Stores
17 Sales Offices
8 Resident Salesmen

Jones & Laughlin Supply Company

"...here's MY warehouse!"

Subsidiary of Jones & Laughlin Steel Corporation

J&L STEEL

TULSA, OKLAHOMA

WAGNER MOTORS
...The choice of leaders in industry

STAMINA COUNTS HERE!

Type DP (Drip-proof) oil well pumping motor. One-piece, cast iron frame designed so that any condensation will immediately drain out of ventilating openings at bottom of motor. Gasket sealed conduit box is dust-tight and waterproof.

...and Wagner Oil Well Pumping Motors have plenty of it!

Electric motors that drive oil well pumping rigs need plenty of stamina. They operate under a blazing sun, in driving rain, in freezing weather. They've got to supply unfailing power, under all these conditions, day in and day out with the very minimum of maintenance and attention. Yes, oil well pumping motors *have* to be tough. That's why so many dependable Wagner Oil Well Pumping Motors are on the job in the oil fields.

Wagner polyphase motors for oil well pumping are built in three electrical types: Normal torque, normal slip; High torque, normal slip; and High torque, high slip. Any type can be provided with Drip-proof, Splash-proof, or Totally-enclosed fan cooled protective enclosures. For applications requiring single-phase motors, Wagner can furnish capacitor-type motors.

Twenty-nine branch offices, located in principal cities, are ready to help you whenever you have a motor problem. Users of Wagner Motors also profit by nationwide service facilities. Bulletin MU-185 gives information on the complete line of Wagner Motors.

WAGNER ELECTRIC CORPORATION
6389 Plymouth Ave., St. Louis 14, Mo., U.S.A.

Wagner Electric Corporation
EST. WE 1891

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS – AIR AND HYDRAULIC

BRANCHES IN 29 PRINCIPAL CITIES

MU-4

Arrow Drilling Company gets extra ton-miles WITH J&L DRILLING LINE

J&L STEEL

Clean to Handle and Clean on the Rig, J&L Drilling Line Means Fewer Line Changes and Less Shut-Down Time in the Long Run

When you have as many rigs working as Arrow Drilling Company, the selection of the right drilling line is mighty important to successful operation. Frequent shut-downs to replace lines are expensive—both in the cost of line and in the cost of down-time. A broken line brings disaster.

Arrow Drilling Company uses J&L drilling line because they can count on it for a nice run in round-trips. It helps their rigs drill deeper with maximum efficiency. And it keeps the cost of line at a minimum.

The crews on Arrow rigs like J&L drilling line too, because it is lubricated with an exclusive, long-lasting Bronzlube that is clean to handle, doesn't run out when the line gets warm.

The next time you order drilling line, why not try J&L? With J&L representatives and warehouses in every part of the oil country, you can depend on prompt delivery and courteous service.

Above Right: Rig 17 shown here reached 10,624 feet after 152 days of continuous operations. J&L Drilling line on this rig has made more than 150 round trips and is still in good condition.

Above Left: Going back in after drill stem testing distillate on Arrow Drilling Co. Rig 17 in Lindsay Field, Garvin County, Oklahoma. In the foreground are Engineer S. E. Hudson, and Crewmen W. E. Hites and K. W. Keenan. Supervising are Tool Pusher L. E. "Mac" McConnell (left), and Driller W. W. "Woody" Moore. Derrickman (not shown) is Ray Satterwhite.

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

Jones & Laughlin Steel Corporation
416 Jones & Laughlin Building
Pittsburgh 30, Pennsylvania

I am interested in using the right wire rope for the job. Please send me a free copy of your handbook "Wire Rope is a Machine."

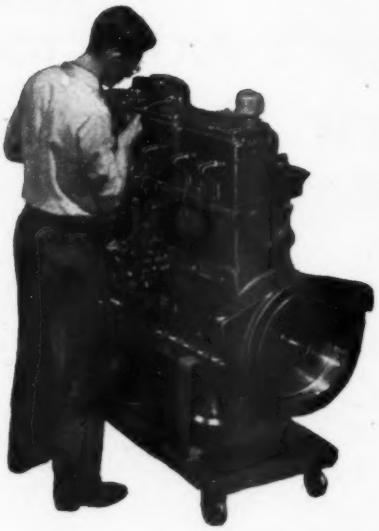
Name_____

Company_____

Address_____

Cummins® Custom-built Diesels

Built not once but Twice

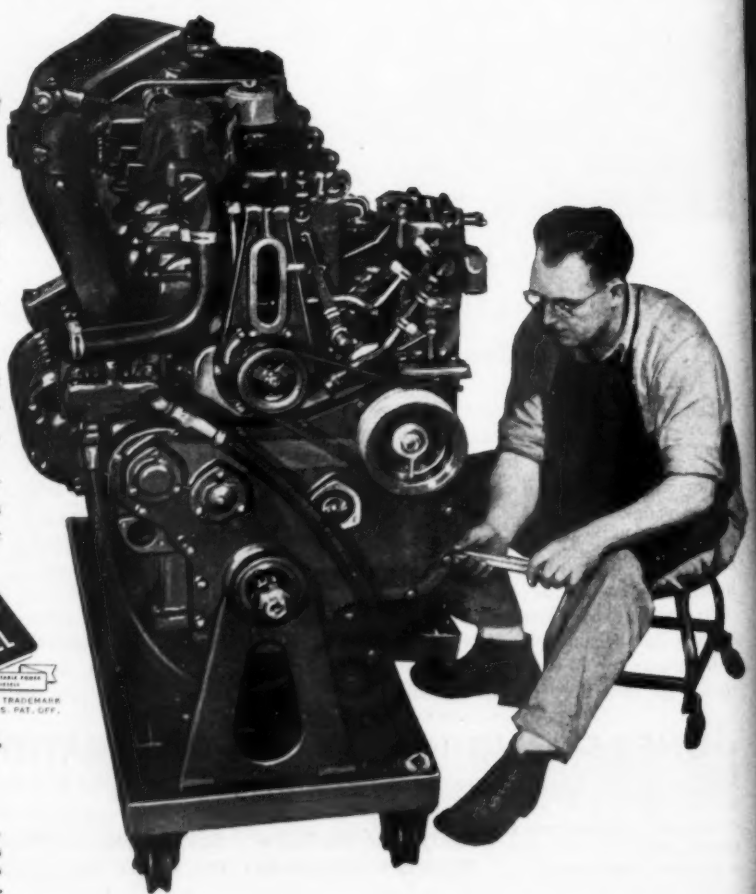


Delivers power at lower cost because it's better built

There's more *useful* power *life* built into every lightweight, high-speed Cummins Diesel, because every engine is actually built *twice*. After initial assembly, each engine is run in on the test block. Then it is torn down and carefully re-inspected—after that it is re-assembled and tested *again*.

Extra care is maintained throughout production. This precision, plus such *extra* features as the Cummins exclusive fuel system, means peak performance, less "down-time" and more rugged, dependable power for every fuel dollar spent.

There's a model engineered for your power needs. Contact your Cummins dealer. He has more facts to show you about making more profits with . . .



Diesel power by CUMMINS

CUMMINS Dependable DIESEL

TRADEMARK REG. U. S. PAT. OFF.

CUMMINS ENGINE COMPANY, INC. · COLUMBUS, IND.

EXPORT: CUMMINS DIESEL EXPORT CORPORATION
Columbus, Indiana, U. S. A. · Cable: Cumdiex

Lightweight High-speed Diesel Engines (50-550 hp) for: On-highway trucks · off-highway trucks · buses · tractors · earth-movers · shovels · cranes · industrial locomotives · air compressors logging yarders and loaders · drilling rigs · centrifugal pumps generator sets and power units · work boats and pleasure craft.

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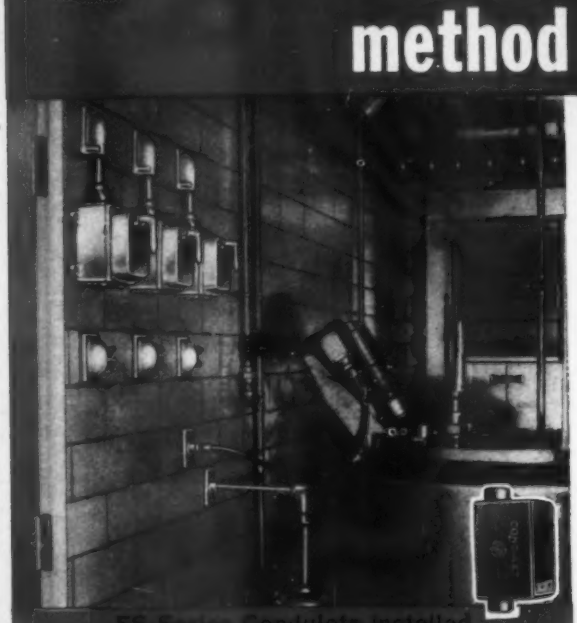
AN Oil Bank
DIRECTED BY Oil Men
IN THE
Oil Capital of
the World
THE FIRST NATIONAL BANK
AND TRUST COMPANY OF TULSA
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

the CONDULET* and rigid conduit method gives you maximum



FS Series Condulets installed in a hollow tile wall.

PROTECTION and SAFETY in concealed work

When you plan a job of concealed electrical wiring, every factor that has a bearing on the kind of service it will give throughout the life of the installation should be carefully considered.

*CONDULETS are made only by CROUSE-HINDS

Type AEC Condulets, with hinged hubs, placed in position on conduit runs.

1 ECONOMY ... Add up the material and the installation costs and you will find that Condulets and rigid conduit compare favorably with other wiring methods. Then consider the other advantages and you will find that Condulet and rigid conduit is the really economical method that pays extra dividends over the years.

2 GROUND CONTINUITY is of vital importance in concealed work because any joint that isn't tight in the beginning makes a high resistance point and after the concrete has been poured there is never any way to locate and correct the faulty condition. CONDULETS, with their taper threaded hubs, and rigid conduit with its tapered threads make a secure joint that provides a reliable and permanent low resistance path to ground. This SAFETY feature affords maximum PROTECTION against personal injury and fire.

3 CORROSION RESISTING ... Cast Feraloy Condulets offer the best PROTECTION wherever moisture, dust, or corrosive atmospheres are present. This quality is very important in concealed work because corrosive tendencies are greatest where there is a change of medium, as at the point between the floor or wall and the air.

4 FLEXIBILITY ... In concealed work Condulets with blank covers can be placed at strategic locations to provide future outlets to meet changing conditions.

5 SECURE ATTACHMENT OF DEVICES ... The mounting holes in CONDULETS are drilled and tapped in the cast metal body — no weak mounting ears to twist off. All devices are FIRMLY attached.

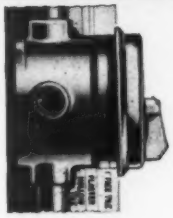
6 QUALITY ... For more than forty-five years CONDULETS, made only by CROUSE-HINDS, have been the standard of quality, built from the finest materials, with painstaking care, by skilled craftsmen.

7 VARIETY ... There are thousands of types and sizes of CONDULETS, plugs and receptacles, and lighting fixtures including a complete explosion-proof and dust-tight line for use in hazardous locations.

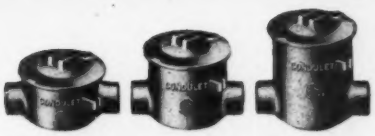
On your next job of concealed work, plan to get all of the benefits of sturdy Cast Feraloy CONDULETS and rigid conduit. Send for additional information on modern CONDULET installation.

CROUSE-HINDS COMPANY
Syracuse 1, N. Y.

Offices: Birmingham — Boston — Buffalo — Chicago — Cincinnati — Cleveland — Dallas Denver — Detroit — Houston — Indianapolis — Kansas City — Los Angeles — Milwaukee Minneapolis — New York — Philadelphia — Pittsburgh — Portland, Ore. — Salt Lake City San Francisco — Seattle — St. Louis — Washington. *Resident Representatives:* Albany Atlanta — Baltimore — Charlotte — New Orleans — Richmond, Va.
CROUSE-HINDS COMPANY OF CANADA, LTD., TORONTO, ONT.



Type EHS Explosion-Proof Switch Condulet in a hollow tile wall



GUA Series Explosion-Proof Condulets with lugs for nailing to concrete forms.

Type AD Watertight Condulets for flush mounting in floors or walls.

Type FJC Condulets for floor outlets. Covers can be drilled and tapped.

GRF Series Condulets with slotted nailing lugs.

Type SKC Condulet and Type EY Large Radius "Y" installed in concrete.

SK Series Condulets with nailing lugs. For walls, floors or sidewalks. Have flush cover screws.

A Nationwide Distribution Through Electrical Wholesalers

Explosion-Proof Type GUA Junction Condulet and Type CPS Arktite Plug Receptacle Condulets in a

Type EY Large Radius Tee in position for pouring a concrete floor.

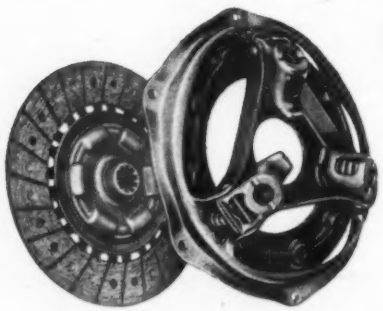
Type AKC Arktite Plug Receptacle

Naturally Alert

naturally creative, naturally progressive, these are Spicer talents that have made Auburn and Brown-Lipe Clutches so outstanding

Spicer has been a "natural" in the automotive industry since 1904. From the very first days of the automobile, Spicer has orginated, developed and improved power transmission equipment of major importance. Typical of Spicer advancements in the automobile, truck, bus and tractor fields are the Auburn and Brown-Lipe Clutches, performance-proved in many millions of installations.

There is an AUBURN CLUTCH for every Passenger Car, Truck, Bus and Wheel Tractor Need



Auburn Clutch pressure springs run cool—retain their full functional action for a long time—because they are mounted on the cover instead of the pressure plate.

6½ Inch

8½ Inch

9 Inch

9¼ Inch

10 and 11 Inch

10 Inch

10½ • 10¾ • 11 Inch

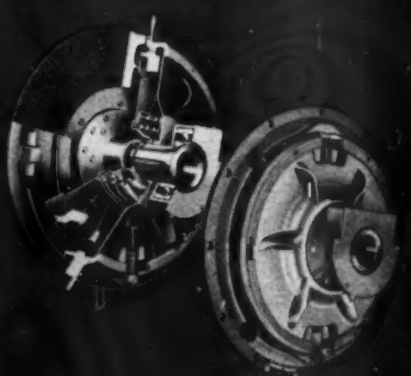
Auburn Clutches have been approved and accepted as original equipment since 1937. They are manufactured in a new, modern plant, fully staffed and equipped with the most modern tools and systems for an annual capacity of over a million complete clutch assemblies. Major features include:

25% Less Weight 30% Fewer Parts
Runs Cooler
Longer Spring Life
Torsional Vibration Damper
Patented Flexible Center
Patented Cushion Eliminates Chatter
New Positive Pull-Back
Complete Range of Sizes

The BROWN-LIPE CLUTCH offers Outstanding Performance for Heavy-Duty Trucks and Buses

Operators experienced with Brown-Lipe Clutches readily accept the small initial higher cost in exchange for the exceptional performance and long life of these units . . . Features include:

UNIFORM OVERALL PRESSURE. Through 360° of pressure plate.
SIMPLE SCREW THREAD ADJUSTMENT. Permits quick, easy adjustment.
LONGER BEARING LIFE. Completely shielded release bearing.
NON-WARPING PRESSURE PLATE. Made of heat treated alloy.
SMOOTH. Flexibility of levers results in smooth pick-up.
NO CHATTER. Assures longer life.
LOW PEDAL PRESSURE. Remains essentially constant throughout clutch life.
FEWER PARTS. Greater efficiency with less upkeep.
INSULATED SPINGS. Not in contact with pressure plate, heat from plate cannot destroy their temper.
ECONOMICAL. Delivered completely engineered, not necessary to design or purchase special transmission front bearing caps, clutch release bearing or housings.



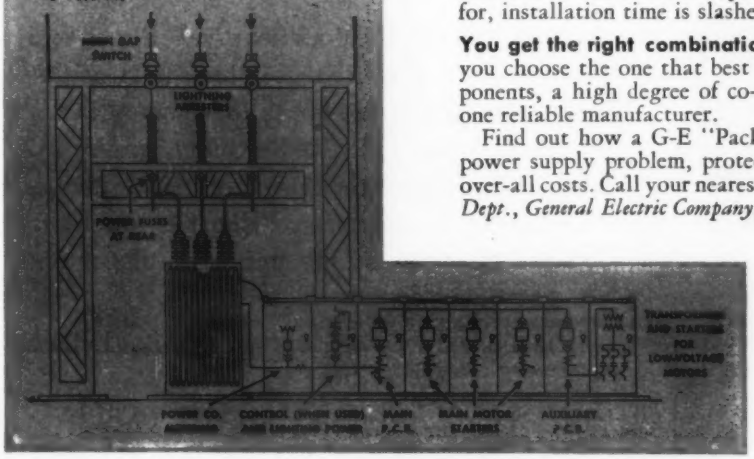
46 YEARS OF
Spicer
SERVICE

SPICER MANUFACTURING *Division of Dana Corporation,* **TOLEDO 1, OHIO**
PASSENGER CAR AXLES • CLUTCHES • TORQUE CONVERTERS • PARISH FRAMES
TRANSMISSIONS • SPICER "BROWN-LIPE" GEAR BOXES • PROPELLER SHAFTS
UNIVERSAL JOINTS • FORGINGS • STAMPINGS • RAILWAY GENERATOR DRIVES

Pipeline power distribution—
ALL YOU NEED IN ONE COST-SAVING PACKAGE!

Typical of the neat appearance and compact arrangement of G-E "Package" substations is this Texas pipeline-station installation. This one unit makes available 115-230-, 480-, and 2400-volt power covering all motor and lighting requirements.

What's in the "Package?" It comprises a complete outdoor steel switching structure—plus a master unit substation. The switching structure may include lightning arresters, disconnecting switches, buses and bus supports, potential transformers and current transformers, relaying and metering equipment, and outdoor oil circuit breakers (or fuses). The unit substation includes transformers and in the switchgear section, motor starters. Ratings are from 750 to 45,000 kva, at incoming voltages from 11 to 69 kv and outgoing voltages up to 13.8 kv.



This one cost-saver—a General Electric "Package" substation—combines *all* the electric equipment your pipeline station needs between incoming utility lines and all motor and lighting circuits. Ordered, designed, and built as a single unit, it comes complete, co-ordinated, ready-to-install.

You reduce system cost Because you don't have to order the components piecemeal, you save engineering cost, as well as time and trouble. And because the entire unit arrives in large, factory-built sections, installation expense is less.

You save time Less drafting and manufacturing time is needed because the over-all design is already largely complete, and the components are in stock or can be built repetitively. With no bottleneck parts to wait for, installation time is slashed.

You get the right combination From scores of standard combinations, you choose the one that best fits your needs. You get the finest of components, a high degree of co-ordination, and responsibility centered on one reliable manufacturer.

Find out how a G-E "Package" substation can solve your pipeline's power supply problem, protect your continuity of operations, help cut over-all costs. Call your nearest G-E office for more information. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

Power supply for pipeline stations is one of many subjects vividly shown in "Lease on the Future," General Electric's "More Power to America" full-color and sound movie on oil field electrification. Ask your nearest G-E office to arrange a showing for you.

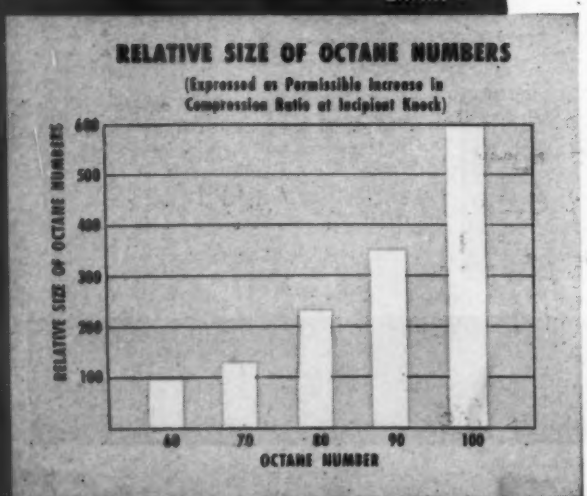
Everything you need to cut oil pipeline costs —electrically!

GENERAL ELECTRIC

661-16

XUM

CHART 1



New light on the EFFECTIVENESS OF THE 2nd & 3rd CC

of tetraethyllead

In measuring the relative effectiveness of the 1st, 2nd and 3rd cc of tetraethyllead when added to a base fuel, it is common practice to use the resulting increase in octane number as the measuring stick. However, this is not completely realistic.

A better yardstick is the relative increase in compression ratio made possible by the additions of tetraethyllead.

The octane scale does not give a direct indication of the performance of fuels in an engine. Units in this scale appear to be equal in size to every other unit. But actually, in terms of engine performance, octane units at different levels vary greatly in size. Chart 1 (lower left) shows how the octane units get bigger and bigger going up the scale.

The usual way of looking at tetraethyllead

Chart 1. This chart shows that the units going up the octane scale become larger and larger in terms of permissible increase in compression ratio.

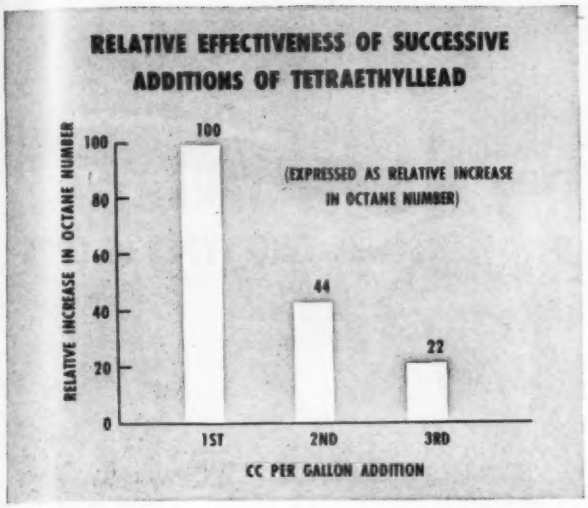


CHART 2

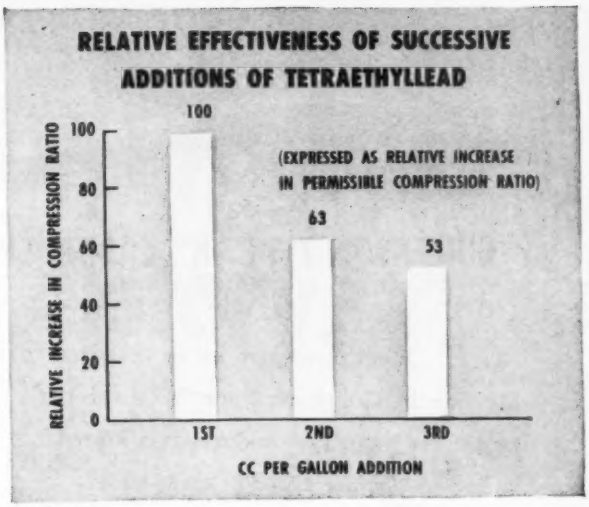


CHART 3

effectiveness is illustrated in Chart 2. This shows the average relative increase in octane numbers due to the addition of 1, 2 and 3 cc of tetraethyllead to twenty current base stocks. (The effectiveness of the 1st cc is considered to be 100%.) In terms of octane numbers, there appears to be a marked tapering off in effectiveness with increase in concentration, to 44% for the 2nd cc and to 22% for the 3rd cc.

On the basis of engine performance, this diminishing unit effectiveness of tetraethyllead with increased concentration becomes much less. Consider the effectiveness of tetraethyllead concentrations from the standpoint of increases in compression ratio made possible in cars on the road (Chart 3). On this basis the 2nd cc is 63% as effective as the 1st, while the 3rd cc is 53% as effective. Thus *the 3rd cc is 84% as effective as the 2nd cc.*

Refiners interested in providing the highest measure of antiknock performance on the road for each dollar of refining cost often obtain substantial economic benefits from periodic re-evaluation of the use of larger amounts of tetraethyllead per gallon. Ethyl technologists gladly assist refiners in their efforts to obtain the best fuel performance for each dollar invested in "Ethyl" antiknock compound.

Previous messages in this series, available on request, have discussed the limitations of the octane scale in the evaluation of the contribution to antiknock quality made by tetraethyllead and have suggested more realistic scales of measurement. Future messages will deal with other benefits contributed to fuels by tetraethyllead.

Over 400 specialists working full time on fuel and engine developments

ETHYL CORPORATION
RESEARCH LABORATORIES

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1600 West Eight Mile Road

SAN BERNARDINO, CALIFORNIA
2600 Cajon Road

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LIFT MORE FLUID

with the BEST SWAB MADE

GUIBERSON TYPE "K" CASING SWAB with TWO TYPES of CUPS

Field men have never hesitated to acclaim the Guiberson Type "K" Swab the best in the industry—and now it is offered with *two distinct types of cups,* to do more jobs for you and do them *better.*

The STANDARD "K" CUP for the day-in, day-out job—lifts more fluid with every trip . . . for deep or shallow wells —wire basket runs at full speed past tubing gaps without loss of fluid or damage to cup.

TYPE "K" CASING SWAB WITH "K" CUPS →

TYPE "K" CASING SWAB WITH "GW" CUPS →

The "GW" CUP is the perfect answer when you're swabbing in old wells . . . in mixed strings . . . in bad pipe. It's ideal for wells with low fluid level, or for taking water off of gas wells. The "GW" brings up the last cupful!

Both of these fine cups are made of a special oil-resistant compound—resilient, yet strong and long-wearing. Made in all tubing and casing sizes . . . quickly and easily interchangeable.

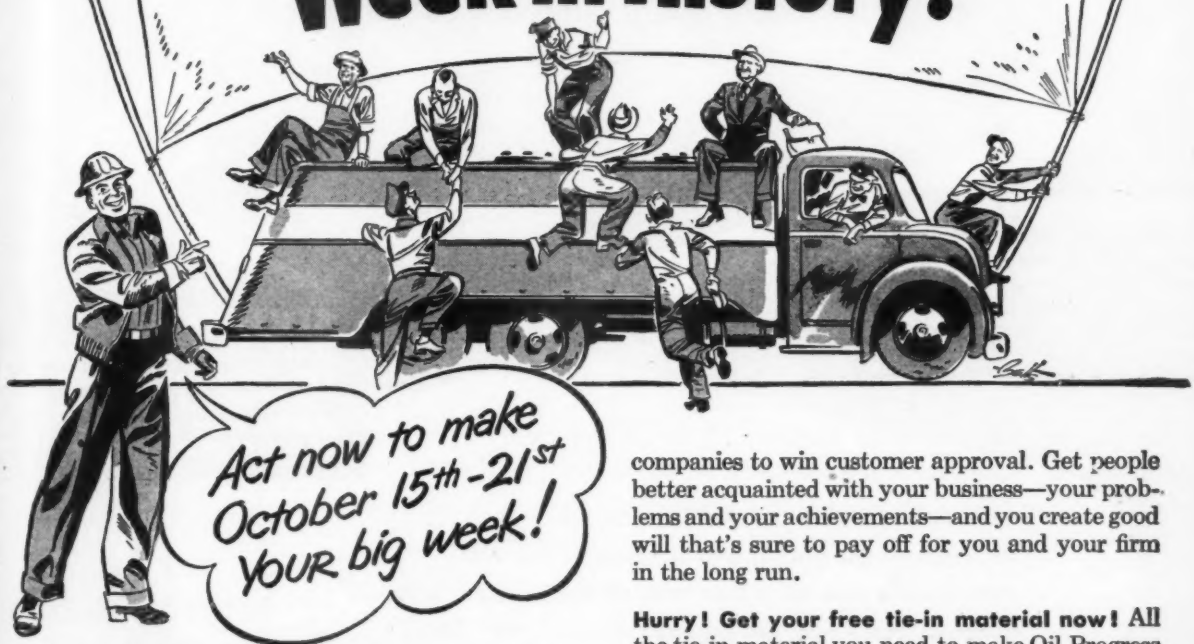
All Guiberson Swabs utilize the correct swabbing principle!

Reg. U. S. Pat. Off.

Sold by Leading Oil Field Supply Stores Everywhere

THE GUIBERSON CORPORATION

Climb aboard! Here comes the Biggest Oil Progress Week in History!



• October 15th-21st will be Oil Progress Week. It's the time when people look to you for a report on progress you and your industry have made.

Last year thousands of oil men throughout the country took advantage of Oil Progress Week to tell their story—with results that paid handsome dividends in good will and good business. This year it is more important than ever to explain how your firm is helping to build up the nation's strength . . . provide America with more and better oil products.

You're the winner! YOU benefit when your customers know about the progress that results from competition in oil . . . how you compete with rival companies to win customer approval. Get people better acquainted with your business—your problems and your achievements—and you create good will that's sure to pay off for you and your firm in the long run.

Hurry! Get your free tie-in material now! All the tie-in material you need to make Oil Progress Week *your* week is now ready. Tie-in ads . . . sample speeches . . . booklets . . . motion pictures . . . window streamers . . . poster designs . . . radio material—it's all ready to use—the biggest, best tie-in package the oil business has ever put together. Get in touch with your local O.I.I.C. office NOW, or write to:

OIL INDUSTRY INFORMATION COMMITTEE

50 West 50th Street • New York 20, N.Y.

Don't miss this chance to win new friends in your community! Make Oil Progress Week your week!

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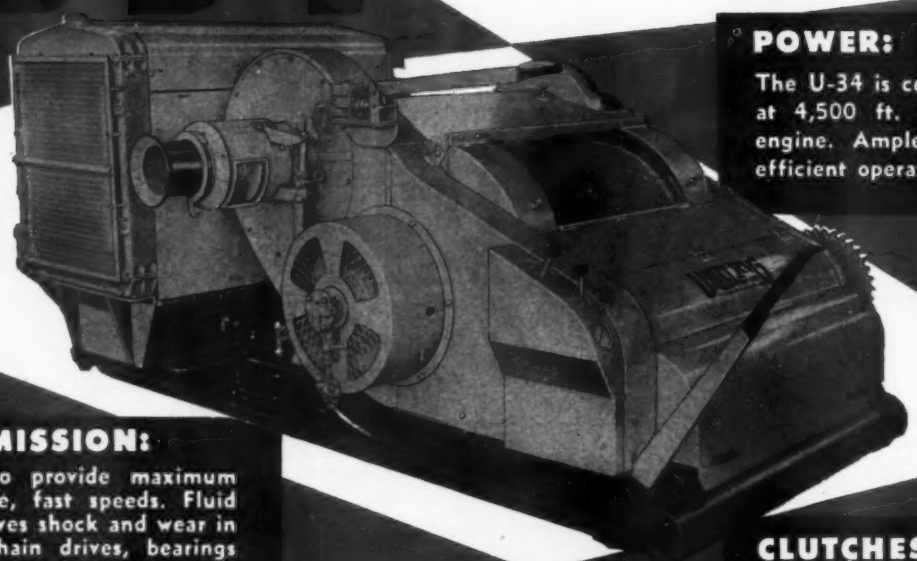
U-34

CUT COSTS on shallow well drilling. . .



POWER:
The U-34 is conservatively rated at 4,500 ft. with a 275 H.P. engine. Ample power for fast, efficient operation and long life.

TRANSMISSION:
Designed to provide maximum pull at safe, fast speeds. Fluid coupling saves shock and wear in clutches, chain drives, bearings and line.

CLUTCHES:
UNIT RIG'S Air-O-Matic . . . time-tested under all conceivable conditions. Eliminates adjustments. Same type used on rigs of much greater capacity.

Smooth, fast, trouble-free performances are the keys to drilling in any well at minimum cost. All these features were taken into consideration when the U-34 was designed. That's why this popular, compact UNIT RIG model is being used more than ever before for shallow well drilling and servicing.

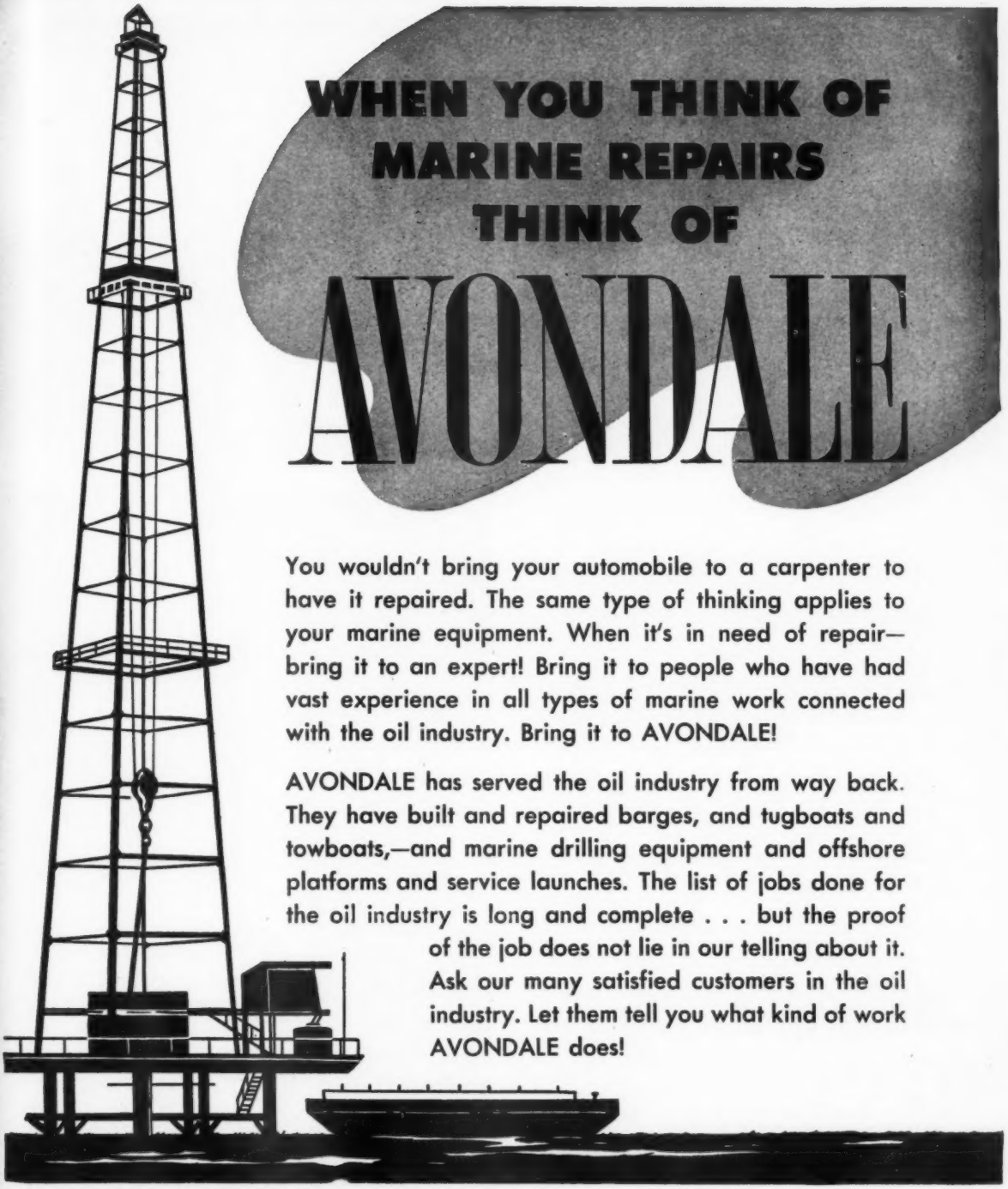
Designed for Top Performance. .

Write for Bulletin

UNIT RIG & EQUIPMENT CO.
TULSA, OKLAHOMA U.S.A.

DESIGNED FOR THE JOB. . . .

Exclusive Export Representative
MID-CONTINENT SUPPLY CO.
42 Broadway, New York City
Cable Address: MIDUNITRIG



WHEN YOU THINK OF MARINE REPAIRS THINK OF AVONDALE

You wouldn't bring your automobile to a carpenter to have it repaired. The same type of thinking applies to your marine equipment. When it's in need of repair—bring it to an expert! Bring it to people who have had vast experience in all types of marine work connected with the oil industry. Bring it to AVONDALE!

AVONDALE has served the oil industry from way back. They have built and repaired barges, and tugboats and towboats,—and marine drilling equipment and offshore platforms and service launches. The list of jobs done for the oil industry is long and complete . . . but the proof of the job does not lie in our telling about it. Ask our many satisfied customers in the oil industry. Let them tell you what kind of work AVONDALE does!

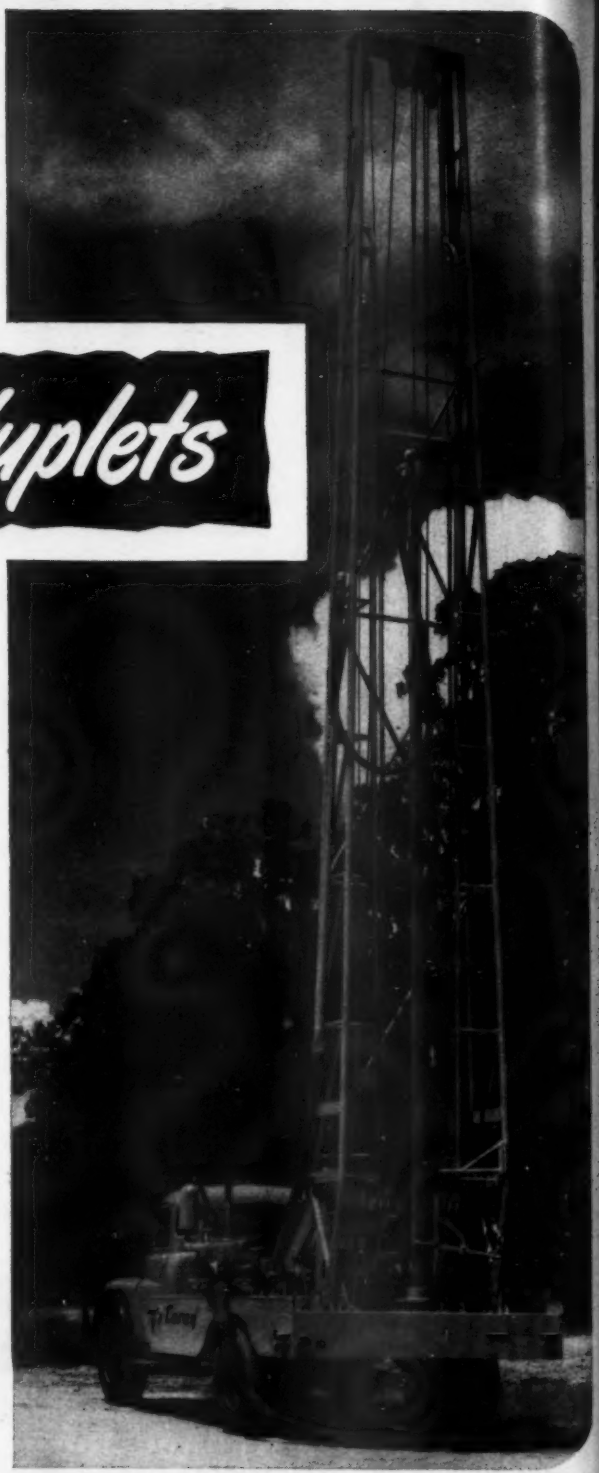
AVONDALE MARINE WAYS, INC.

STEEL

RIVER FRONT, MAILING ADDRESS: NEW ORLEANS DISTRICT WESTWEGO, LOUISIANA

MAIN PLANT: AVONDALE, LA.
QUICK REPAIR PLANT — HARVEY, LA.

The Carey *Quintuplets*



Careys Machine Company, Houston, uses *FIVE* Twin Disc Clutches on its new Model 3 Drill—three oil-type Model MT Clutches in the power transfer case and two Model CL units to drive the drawworks.

Designed for shot-hole, core-hole and water-well drilling, the new Carey drill is rated at 1500 feet. Smooth-operating, long-wearing clutches are a "must" on rigs like this. In Twin Disc Clutches these characteristics are "built-in."

That's why Twin Disc Clutches . . . also famous for simple adjustment, fast action, easy engagement . . . are standard equipment on leading rigs. For complete information write for Bulletin 120-C.

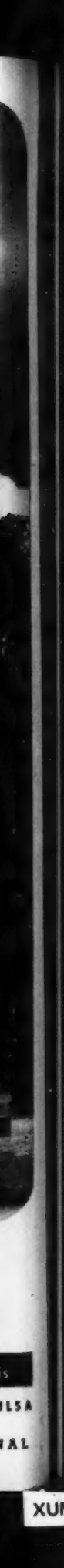
Careys Machine Company's Model 3 Drill . . . Twin Disc Clutch-equipped for high wear-life under rapid-cycle operation.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

Clutches & Hydraulic Drives

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA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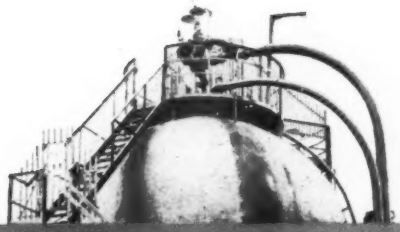
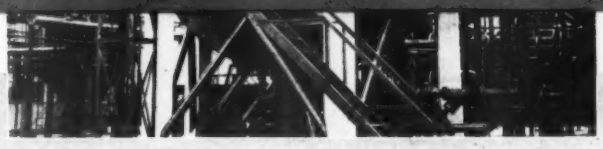


to give true economy in salt removal a desalting process must provide



MAXIMUM PERFORMANCE...

Getting "most of the salt" is not enough. In every installation Petreco engineers aim at 100% removal — and they're getting it, or closely approaching it, time after time. Some Petreco users now install desalters to treat crudes considered "comparatively salt free" only a few years ago. *Maximum salt removal permits top refining efficiency—you get PERFORMANCE with PETRECO.*

COMPETENT SERVICE...

Petreco engineers supervise construction on every installation. Petreco resident engineers are on 24-hour emergency call. Petreco research technicians and laboratory facilities are always ready to assist refiners on salt problems. Petreco engineers regularly inspect the desalting equipment and check its performance. Petreco warehouses replacement parts close to all major refining centers. *You get SERVICE with PETRECO.*

FAST PAY OUT...

One refiner states that Petreco Desalting "paid out" in *three months!* Another cited a *five months* payout. Payouts such as these represent substantial savings for any refiner charging salty crudes. The reasons most frequently cited for Petreco's fast payout are: Less plugging in crude furnaces, heat exchangers and reduced crude furnaces; less corrosion in topping units. *You get FAST PAY-OUT with PETRECO.*

OPERATIONAL FACTS...

If you have a desalting problem, ask Petreco for facts and figures—Petreco engineers can tell you why Petreco desalters deliver such high removal percentages, how Petreco Service is designed to help you, and why, how and where Petreco Desalters have more than paid their own way. *Get facts! They're available from*

Only PETRECO OFFERS COMPLETE DESALTING SERVICE PERSONNEL AND FACILITIES

PETROLEUM RECTIFYING COMPANY

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1390 E. BURNETT ST., LONG BEACH, CALIF.

PETRECO

SPECIALIZED *Electric* PETROLEUM PROCESSES { DESALTING / DEHYDRATING

PR 50-2

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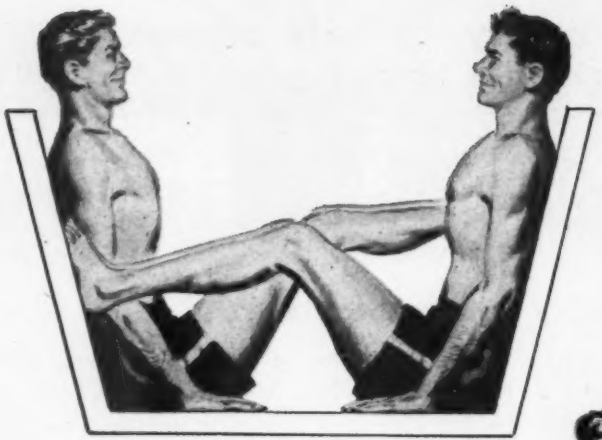
U. S. V-BELTS are packed with PULLING POWER...



BECAUSE THE SIDEWALLS COMPLETELY GRIP THE GROOVES FOR THE FULL HEIGHT OF THE BELT

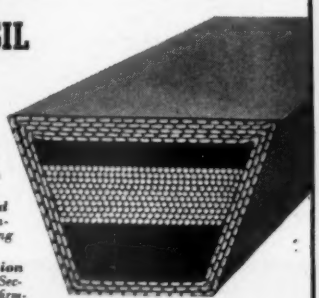
GREATER PULLING POWER... BECAUSE OF PROTECTIVE JACKETS WHICH ALSO KEEP OUT DIRT AND PROLONG WEAR!

U. S. V-Belts have more pull, more shock resistance, and special protective jackets to keep out dirt and abrasive particles. The extra strength and resilience for the tough jobs are provided by the unique "Equa-Tensil Cord Section"—a unit of multiple pulling cords in which *each* cord pulls its balanced share of the load, allowing the entire belt to absorb rough shocks and take heavier loads. All Rainbow V-Belts have low stretch characteristics.

A "U. S." belt specialist will show you how to make every belt in multiple assemblies pull its equal share of the load. After you have had this unique "U. S." service, every belt will run smoothly on its sheaves.

Send for a free copy of the design and selection data manual, "U. S. RAINBOW MULTIPLE AND FRACTIONAL V-BELT DRIVES." Write United States Rubber Company, Mechanical Goods Division, New York 20, N. Y.

EQUA-TENSIL CORDS



***1. Top Rubber Cushion** in closely engineered balance with the lower section . . . to keep cool under constant stretch and turn.*

***2. Equa-Tensil Cord Section**—all cords scientifically placed, each pulling its share of the load.*

***3. A sturdy level cushion** for the Equa-Tensil Cord Section provides structural firmness for V-grooves and over the flat pulley of V-to-flat drives.*

PRODUCT OF U.S.RUBBER SERVING THROUGH SCIENCE

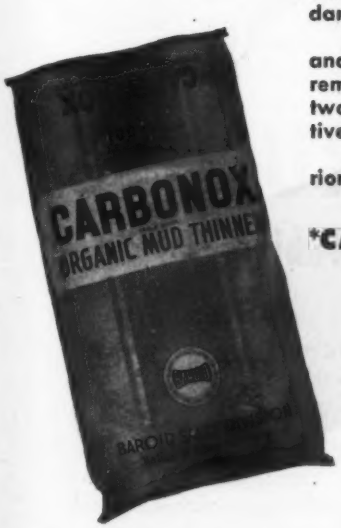
UNITED STATES RUBBER COMPANY

It's Worse in Your Well!

● **Thick mud endangers any drilling operation. Viscous, high-gel-strength drilling fluid causes swabbing and retains gas and cuttings. It multiplies the danger of stuck pipe and blowouts. It menaces every drilling operation.**

Drilling through mud-making shales and clays, and entraining of sand and cuttings will thicken mud to the danger point unless preventive or remedial measures are taken. More and more operators find that Baroid's two new organic mud thinners, Carbonox and Tannex, give the most effective solution to thinning poblems.

Furthermore, these two modern thinners will not lump or cake, or deteriorate in storage, regardless of the weather.



***CARBONOX:**

An organic, non-hygroscopic drilling mud thinning compound. Carbonox resists salt contamination and works well in either normal or high-pH drilling muds. Carbonox requires less caustic soda than does quebracho. Otherwise it can be used like, and for the same purposes as, quebracho.

TANNEX:

An improved quebracho drilling mud thinning compound. It will not lump or harden in storage or use. Tannex is used exactly like ordinary quebracho, and with the same amount of caustic soda as used with quebracho.

***Carbonox is also the emulsifying agent in the new highly successful Baroid Emulsion Mud. Your Baroid service engineer will tell you all about these products. Or fill out and mail the coupon below.**

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Ask Your Baroid Man about these....

Baroid Sales Division, Department 1
P.O. Box 2258, Terminal Annex, Los Angeles 54, Calif.
Send me detailed information on CARBONOX and TANNEX organic mud thinners.

Name
Company Title
Street
City State

BAROID MUD THINNERS

BAROID SALES DIVISION NATIONAL LEAD COMPANY
LOS ANGELES 12 • TULSA 3 • HOUSTON 2

XUM

STAINLESS STEEL MECHANICAL AND PRESSURE TUBING

These are common sizes. Intermediate sizes, larger or smaller diameters, heavier or lighter walls, or geometric shapes other than round also are available.

OUTSIDE DIAMETER	GAUGE RANGE	OUTSIDE DIAMETER	GAUGE RANGE
3/8"	16-25	1-11/16"	10-20
7/16"	16-25	1-3/4"	10-20
1/2"	14-25	1-7/8"	10-20
9/16"	14-25	2"	9-20
5/8"	14-24	2-1/8"	9-20
11/16"	14-24	2-1/4"	9-20
3/4"	13-24	2-3/8"	8-20
13/16"	13-24	2-1/2"	8-20
7/8"	12-23	2-5/8"	8-20
15/16"	12-23	2-3/4"	8-20
1"	11-23	2-7/8"	8-20
1-1/16"	11-22	3"	8-20
1-1/8"	11-22	3-1/4"	8-16
1-3/16"	11-22	3-1/2"	8-16
1-1/4"	11-22	3-3/4"	8-16
1-5/16"	11-20	4"	8-16
1-3/8"	11-20	4-1/4"	8-16
1-7/16"	11-20	4-1/2"	8-16
1-1/2"	10-20	4-3/4"	8-16
1-9/16"	10-20	5"	8-16
1-5/8"	10-20		

The above sizes are available in types 304, 309S, 310, 316, 317, 321, 347 and 430. Type 302 is available in a limited range of sizes for ornamental use.

STAINLESS STEEL PIPE

NOMINAL PIPE SIZE	OUTSIDE DIAMETER	SCHEDULE 40S STANDARD PIPE WALL THICKNESS	SCHEDULE 10S LIGHT WALL PIPE WALL THICKNESS
1/8"	.405	.068	.049
1/4"	.540	.088	.065
3/8"	.675	.091	.065
1/2"	.840	.109	.083
3/4"	1.050	.113	.083
1"	1.315	.133	.109
1-1/4"	1.660	.140	.109
1-1/2"	1.900	.145	.109
2"	2.375	.154	.109
2-1/2"	2.875	—	.120
3"	3.500	—	.120
3-1/2"	4.000	—	.120
4"	4.500	—	.120

The above Pipe Sizes are available in the Chrome-Nickel analyses of Republic ENDURO Stainless Steel.

ELECTRUNITE

Stainless Steel Tubing and Pipe

● NOW . . . up to and including 5" O.D. . . . ELECTRUNITE Tubing made of time-tested Republic ENDURO* Stainless Steel.

In 1947, the ELECTRUNITE Size Range was expanded to include the pipe sizes listed at the left. Today, Steel and Tubes keeps pace with your expanded requirements by offering a complete range of stainless steel tubing sizes produced by the continuous welding method.

Republic—world's largest producer of stainless and alloy steels—offers you prompt metallurgical assistance with any problem involving the use of stainless steel tubing or pipe. Write, wire or phone *today* for further information.

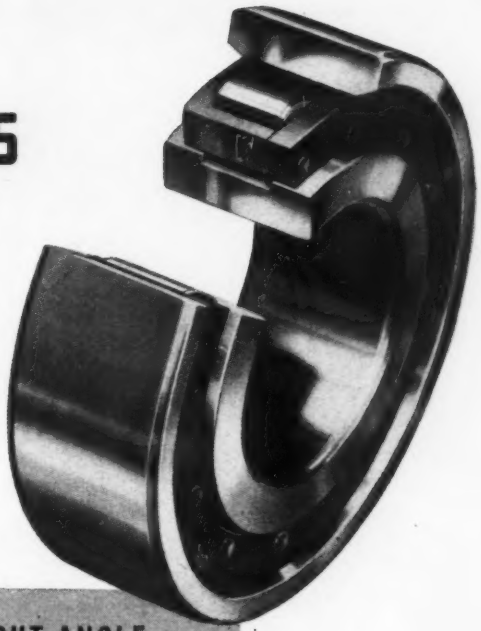
REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION • CLEVELAND 8, OHIO
Export Dept.: Chrysler Bldg., New York 17, N. Y.

Republic
REPUBLIC STEEL
ELECTRUNITE
STAINLESS STEEL TUBING AND PIPE

Why ROLLWAY'S

RIGHT ANGLE DESIGN

Steps Up Performance...
...Keeps Down Costs

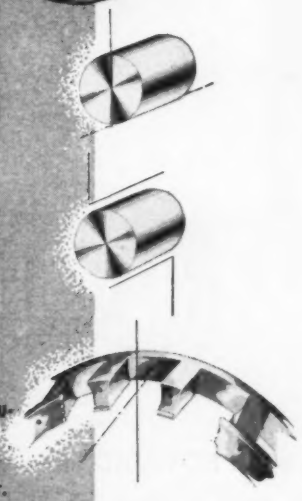


Bearing life and performance are stepped up and kept up, maintenance and replacement costs drop, because of the *inbuilt trueness* of Rollway's right angle design. This basic precision principle greatly reduces sliding friction, end-rub, side-shock of the rollers. It balances the internal forces within each bearing, and promotes *true rotation* of the rollers around the shaft.

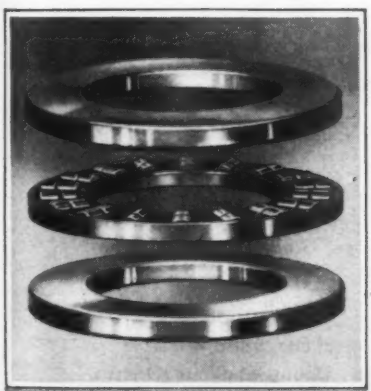
RIGHT ANGLE
ROLLER ENDS, precisely square to avoid end-rub, oscillation and side-shock.

RIGHT ANGLE
BEARING SURFACES—parallelism that promotes unwavering rightline rolling.

RIGHT ANGLE
SEPARATOR SLOTS, accurately machined to prevent roller skew, slide and uneven wear.



ROLL the RIGHT Way with ROLLWAY



In thrust bearings, too, the RIGHT ANGLE is better

Heavy thrust loads are carried best when the bearing is loaded at right angles to the roller surfaces. This feature of Rollway Thrust Bearings eliminates compound loads and complicated stress—promotes high efficiency and longer life.

Let's examine the bearing problems together to give you exactly the bearings you need. Our years of specialized bearing experience, plus complete engineering and metallurgical services are always available. No cost—no obligation. Just write or wire ROLLWAY BEARING CO., INC., SYRACUSE, N. Y.

ROLLWAY BEARINGS

Complete Line of Radial and Thrust Cylindrical Roller Bearings

SALES OFFICES: Syracuse, Boston, Cleveland, Philadelphia, Pittsburgh, Detroit, Chicago, Birmingham, Minneapolis, Houston, Los Angeles

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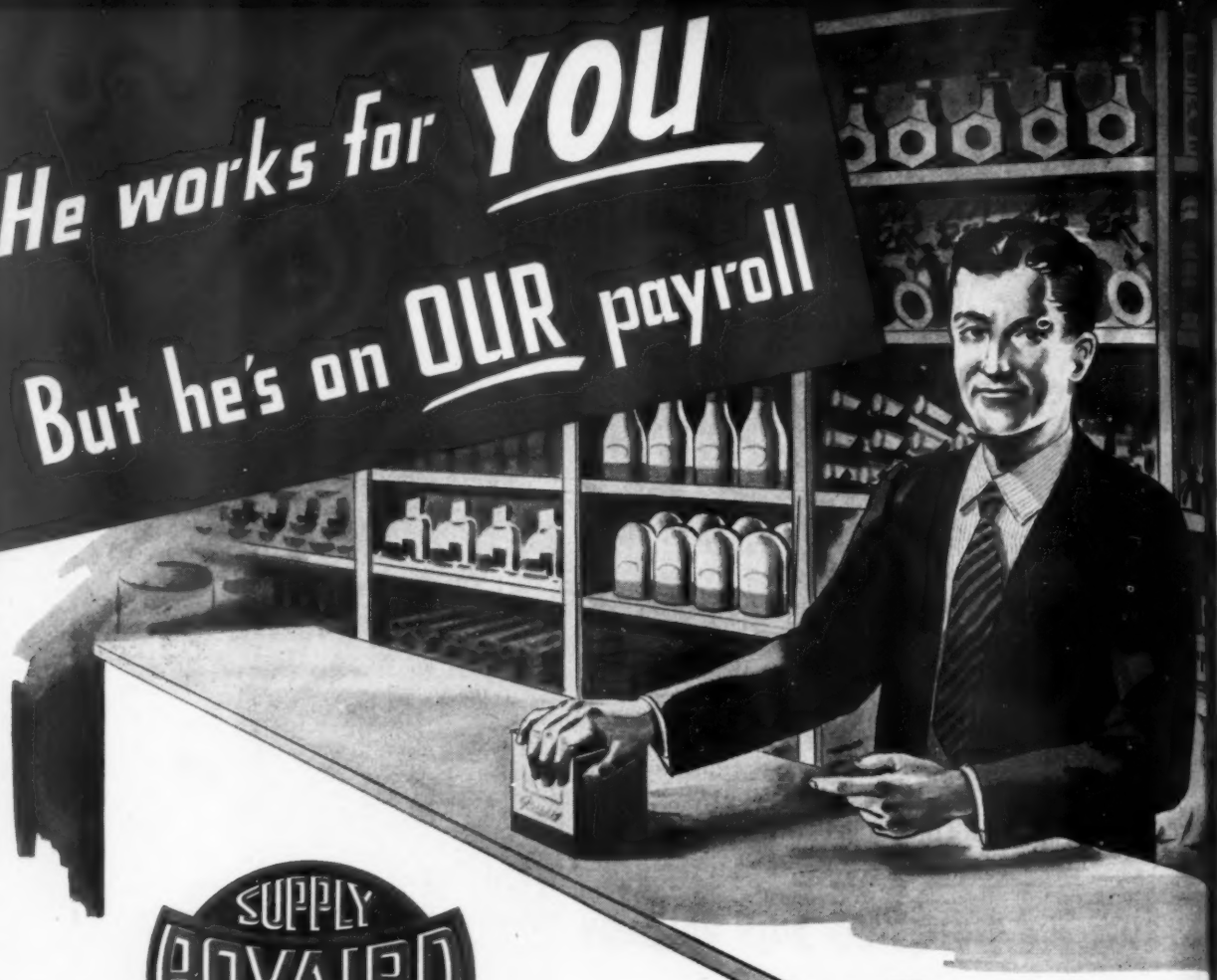
He works for YOU
But he's on OUR payroll



SUPPLY BOVAIRD COMPANY

PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION MEMBER

In each BOVAIRD store you'll find capable men whose job it is to give YOU service—men to help you select the right supplies for your particular job.

BOVAIRD stores maintain complete stocks of nationally known brands of supplies, field tested and proved, to assure you of getting the supplies you need — when you need them.

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ILLINOIS—Clay City, Grayville, Salem
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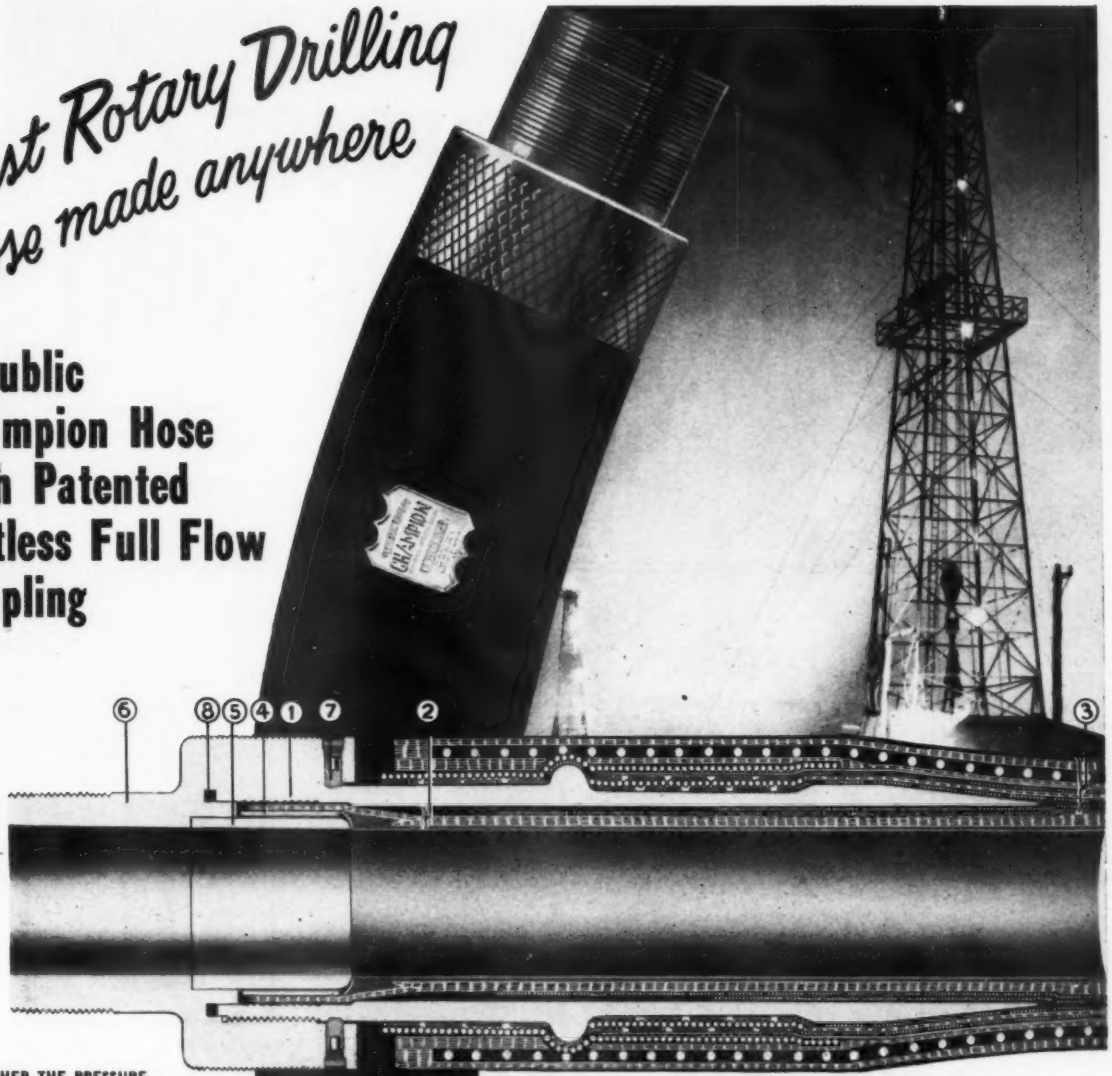
TEXAS—Borger, Dallas, Midland, Odessa, Pampa, Snyder

"Buy From Bovaird"

THE Bovaird SUPPLY CO.
GENERAL OFFICES
TULSA, OKLAHOMA

Best Rotary Drilling Hose made anywhere

Republic Champion Hose with Patented Boltless Full Flow Coupling



U. S. PATENT No. 2,234,350

THE HIGHER THE PRESSURE . . . THE TIGHTER THE SEAL

In Champion Rotary Drilling Hose the nipple (1) is built in between the metal reinforcements of the hose carcass (2) and (3). The inner reinforced rubber structure (2) is anchored within the nipple and locked into leak-proof engagement by a brass expansion ring (4). This ring receives plenty of protection from the abrasive action of flowing grit by a special steel guard ring (5). As pressure pushes the reinforcing rubber structure (3) against the nipple assembly, a leak-proof union is established, and, ***as the pressure continues to increase, the tighter the seal becomes!*** Note that the cover cap (6) screws into position over the nipple assembly. It fits flush with the external diameter of the hose, leaving no projections to catch on the rigging or interfere with connections. The cap is held in position by submerged set screws and anchor cap seals (7). A rubber gasket (8) seals the joint between cap (6) and end of nipple (1).

● Republic's Champion Rotary Drilling Hose is a strong, flexible hose that's built to withstand severe shock and higher pulsating pressures.

Built-in steel muscles resist pressure, protect the hose against distortion. Oil-resistant Reprene throughout makes the hose practically immune to abrasion or deterioration from oil contact.

Champion Rotary Drilling Hose is available in standard lengths up to 60 feet. Type C Hose designed for 5000 psi test pressure, Type B for 4000 psi and Type A for 3000 psi. See your Republic Distributor or write direct for further information.

INDUSTRIAL RUBBER PRODUCTS BY

REPUBLIC RUBBER DIVISION

Lee Rubber & Tire Corporation

YOUNGSTOWN, OHIO

MID-CONTINENT DISTRIBUTORS

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Jones & Laughlin Supply Co.
230 Park Ave.,
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WEST COAST DISTRIBUTORS

W. C. Hendrie & Co., Inc.
405 Towne Ave.
Los Angeles, Calif.

Pacific Coast Rubber Co.
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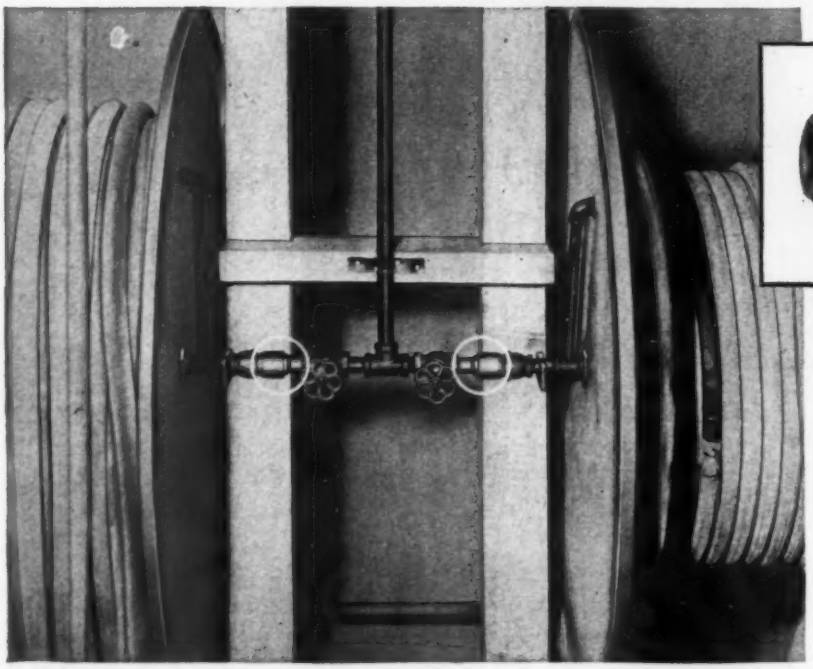
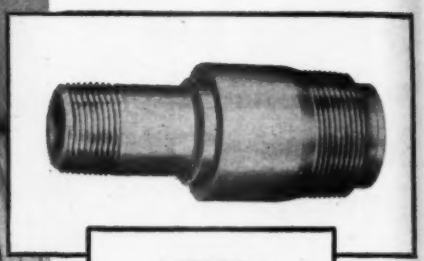
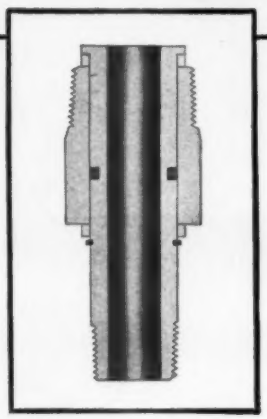
For Hose Reels, and Loading and Unloading Lines

It's the New LEAKPROOF ✓

BARCO SWING JOINT







LOW COST • COMPACT DESIGN

Barco adds to its famous line of joints this remarkable new Swing Joint, the result of careful planning and design. The construction is extremely simple, with a long bearing surface and no side flexibility. Also suitable for constant, slow rotation and pressures up to 1000 lbs. with temperatures from −50° to +165°. Supports piping arrangements easily. Write for more information to Barco Manufacturing Company, 1839J Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal. Our engineers are ready to help you.

The New BARCO SWING JOINT

BARCO—*The Only Truly Complete Line of Flexible Swivel and Revolving Joints*

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

● It would be difficult to find a tougher job for protective coatings. Yet, coatings formulated with VINYLITE Brand Resins are protecting offshore drill rigs in the Gulf of Mexico with almost unbelievable effectiveness.

After months, even years, these coatings are virtually good as new—despite constant exposure to corrosive attack by sea water, crude oil, air, sunlight, the buffeting of debris in pounding seas, and the repeated scraping contact with small boats.

They are the same type coatings that, after two years on oil tanks and pipelines in western Texas, were virtually good as new when 85% of other coatings were completely destroyed. They are the same acid-, alkali-, and chemical-resistant coatings that have set impressive new records for economy in protecting tanks, pipes, and chemical equipment throughout the chemical and processing industries.

Coatings based on VINYLITE Brand Resins save the cost of frequent refinishing. They remain intact despite long service—retaining their integrity and bond. They are equally effective on metals, concrete, and wood. They protect equipment from contamination by contents and contents from contamination by equipment. For the latest technical data and information on suppliers of coatings based on VINYLITE Brand Resins, write Dept. HO-68.

Data courtesy Minnesota Mining and Mfg. Co., 411 Piquette Ave., Detroit, Mich.

Visit the National Plastics Exposition, Navy Pier, Chicago, March 28-31

Vinylite BRAND **RESINS**

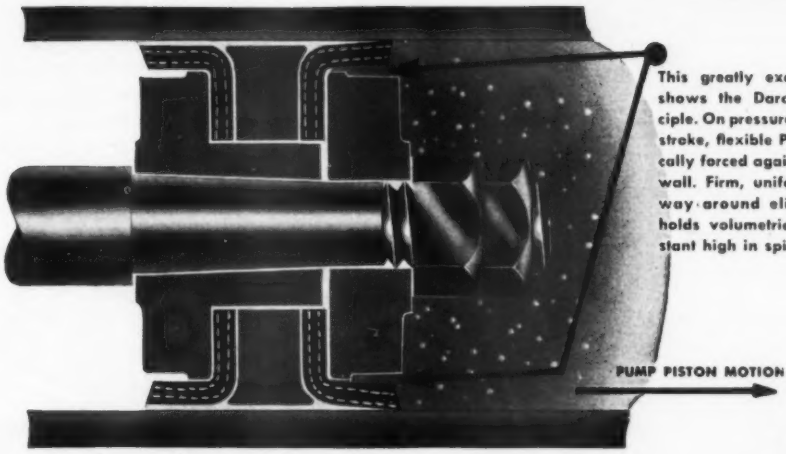
BAKELITE DIVISION

UCC

BAKELITE DIVISION, *Union Carbide and Carbon Corporation*, 30 East 42nd Street, New York 17, N. Y.

XUM

ONLY MM MINNEAPOLIS-MOLINE OIL FIELD POWER OFFERS COMPLETE TEMPERATURE CONTROL!
MM oil field units maintain *uniform temperatures throughout the engine*—eliminating sludge . . . reducing number of oil changes . . . prolonging periods between servicing . . . greatly extending time between overhauls *even under the most difficult oil field conditions!* Heat exchanger base pan and by-pass thermostat help keep top-to-bottom temperature *constant* regardless of load or atmospheric temperature.
Skillful engineering and advanced design make MM Power Units steady, dependable power producers. High turbulence combustion chambers and controlled cooling contribute to high, efficient power output. Cylinder heads and blocks are removable for low-cost servicing. Precision-built shell type bearings are replaceable.
MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA
OIL FIELD EQUIPMENT
SMECO
For complete facts on the extra performance, dependability, longer life and satisfactory service you get in MM Oil Field Power, consult:
SHRIMPTON MANUFACTURING AND SUPPLY CO.
Los Angeles 22, California, 2700 S. Eastern Avenue
Kilgore, Texas, 413 N. Commerce Street
Oklahoma City 8, Okla., 219 South Pennsylvania Ave.



This greatly exaggerated diagram shows the Darcova Pumcup principle. On pressure side of each piston stroke, flexible Pumcup is automatically forced against liner or cylinder wall. Firm, uniform contact all the way around eliminates slippage, holds volumetric efficiency at constant high in spite of gradual wear.

THEY NEVER RELAX
when the pressure is on!

HERE is a piston packing that actually takes *advantage* of the fluid pressure built up in reciprocating pumps and in air or hydraulic mechanisms. The illustration above shows how Darcova Pumcups utilize this pressure . . . how they hug the cylinder wall on every work-stroke of the piston, preventing needless slippage.

Then, too, friction between the Pumcup and cylinder is automatically "pressure-equalized" all the way around for a uniformity of wear otherwise impossible. And, in contrast to other types of packing, fluid slippage does not increase with wear. Peak volumetric efficiency is retained even when Pumcup wear is far advanced.

Consequently, Pumcups offer two mighty important advantages. First, downtime and material and maintenance costs are cut to a fraction because Pumcups outlast other types of packing many times over. Secondly, volumetric efficiency is held constant.

Everything considered, it is easy to see how thousands of Darcova Pumcup users are saving up to $100 per pump per year. Easily installed, Pumcups replace ordinary packing in reciprocating pumps and in air or hydraulic mechanisms. They are precision built in ½ to 42 inch sizes and in many different textures for practically all fluids, pressures and temperatures.

DARCOVA
THE ORIGINAL COMPOSITION CUP

***FREE BULLETIN**—For a free bulletin containing complete information, write, or use the coupon below.*

DARLING VALVE & Manufacturing Co.
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Darling Valve & Mfg. Co., Williamsport 1, Pa.
Please send me the free bulletin checked below:
☐ No. 4401 Darcova Pumcups for reciprocating pumps.
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GULF OIL CORPORATION

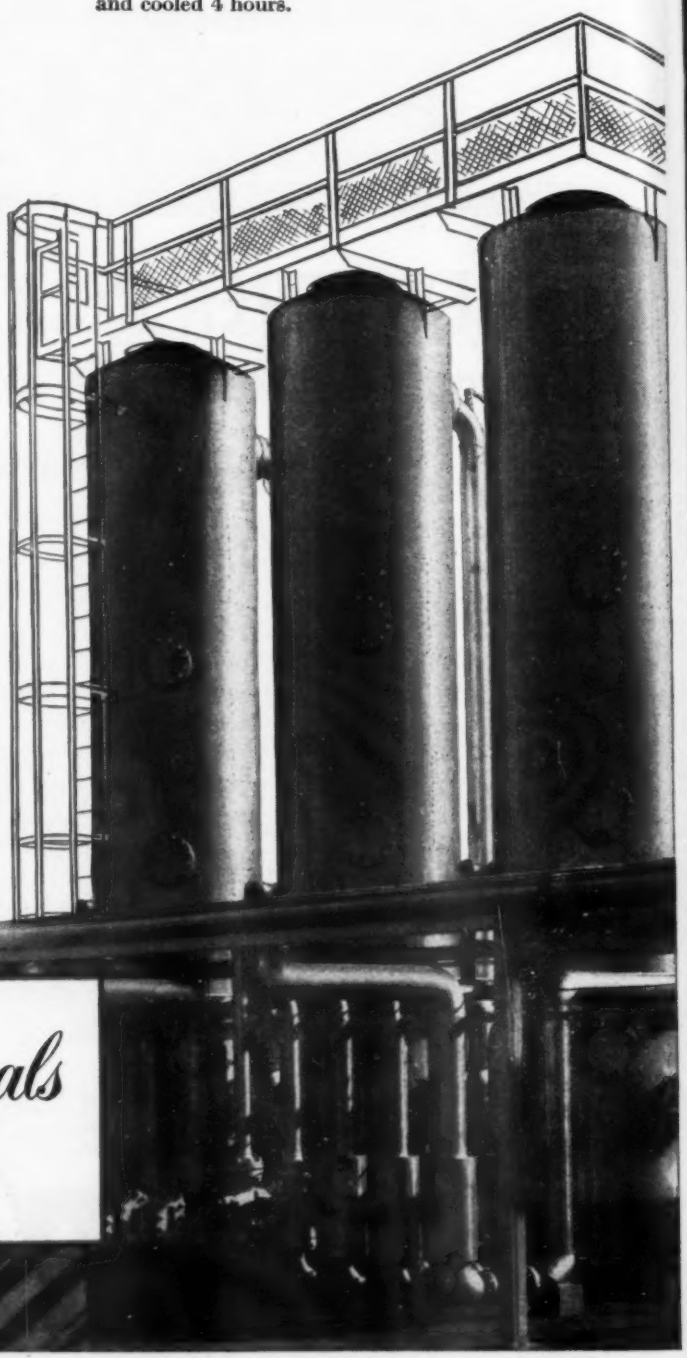
USES ALCOA

ACTIVATED* ALUMINA

IN AUTOMATIC

3-TOWER DEHYDRATOR

Gulf Oil Corporation's 3-tower dehydrator unit at Eunice Gasoline Plant, Eunice, New Mexico. Drying 32,000,000 standard cubic feet of residue gas per day to dew points *well below 0° F.*, the unit permits each tower to be on stream 4 hours, reactivated 4 hours and cooled 4 hours.



This unique 3-tower dehydrator unit is entirely automatic, except for an occasional dew point check.

In such a system, the *reliability* of the desiccant is highly important—a good reason for choosing ALCOA *Activated* Alumina. It is one of the few solid-type drying agents that will not change its form or properties. It will not swell, soften or disintegrate even when immersed in water.

ALCOA *Activated* Alumina is non-corrosive and practically iron-free. It is not affected by shock or abrasion, and has no effect on the end product even when the two stand in contact for long periods. It is a uniformly pure desiccant that dries liquids and gases to a lower dew point than any other commercial adsorbent.

Let us send you the booklet "Activated Alumina—Its Properties and Uses." Its 48 illustrated pages describe the properties and applications of ALCOA *Activated* Alumina. Write to ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 618J Gulf Building, Pittsburgh 19, Pa.

**Reg. T. M., Aluminum Company of America*

Alcoa Chemicals

ALCOA

ALUMINAS and FLUORIDES

ACTIVATED ALUMINAS • CALCINED ALUMINAS • HYDRATED ALUMINAS • TABULAR ALUMINAS • LOW SODA ALUMINAS ALUMINUM FLUORIDE • SODIUM FLUORIDE • SODIUM ACID FLUORIDE • FLUOBORIC ACID • CRYOLITE • GALLIUM

STANDARD OIL has told about its employees and its owners in previous advertisements in its institutional campaign. This, the current insertion, tells about a third group of people on whom we depend: our customers.

MR. AND MRS. J. L. LANGLEY of Fond du Lac probably never think of themselves as the kind of people who make America tick —but they are. Mr. Langley is an insurance claim adjuster, a civic-minded taxpayer, a good provider for his family. Mrs. Langley keeps the home for her husband and two daughters, yet finds time for useful community service. You'd be glad to have the Langleys as friends—and we're proud that they have been customers for Standard Oil products for many years.

THESE ARE THE PEOPLE WE TREASURE

You know that you are appreciated as a customer. We appreciate the Langleys and millions of other customers of ours. We treasure them—and one reason why is that we have to work hard to get them and hold them.

Hardly any business is more competitive than the one we're in. Americans can buy petroleum products from thousands of separate companies, from a quarter of a million service stations.

That's why Standard Oil is careful in selecting the many thousands of independent service station dealers who sell our products to you. All of them, by the way, are men who had a chance to look over the field and who decided that Standard is the company they want to do business with.

Our training programs aim to help our dealers serve you better. Their stations are located where it will be as handy as possible for you to buy. And we make fine products for them to sell.

One reason why we can make better products more economically, and make them more readily available, is that Standard Oil and its subsidiary companies are an integrated organization. Our 46,700 employees work together to find crude oil, transport it, refine it into more than 2,000 useful products and distribute those products for sale.

The quality petroleum products you find at the Standard oval torch sign have been well established favorites for years. For example, more of you buy RED CROWN Gasoline than any other brand. In a competitive business like ours, this is something to be proud of. We treasure you as a customer, and work to hold your confidence.

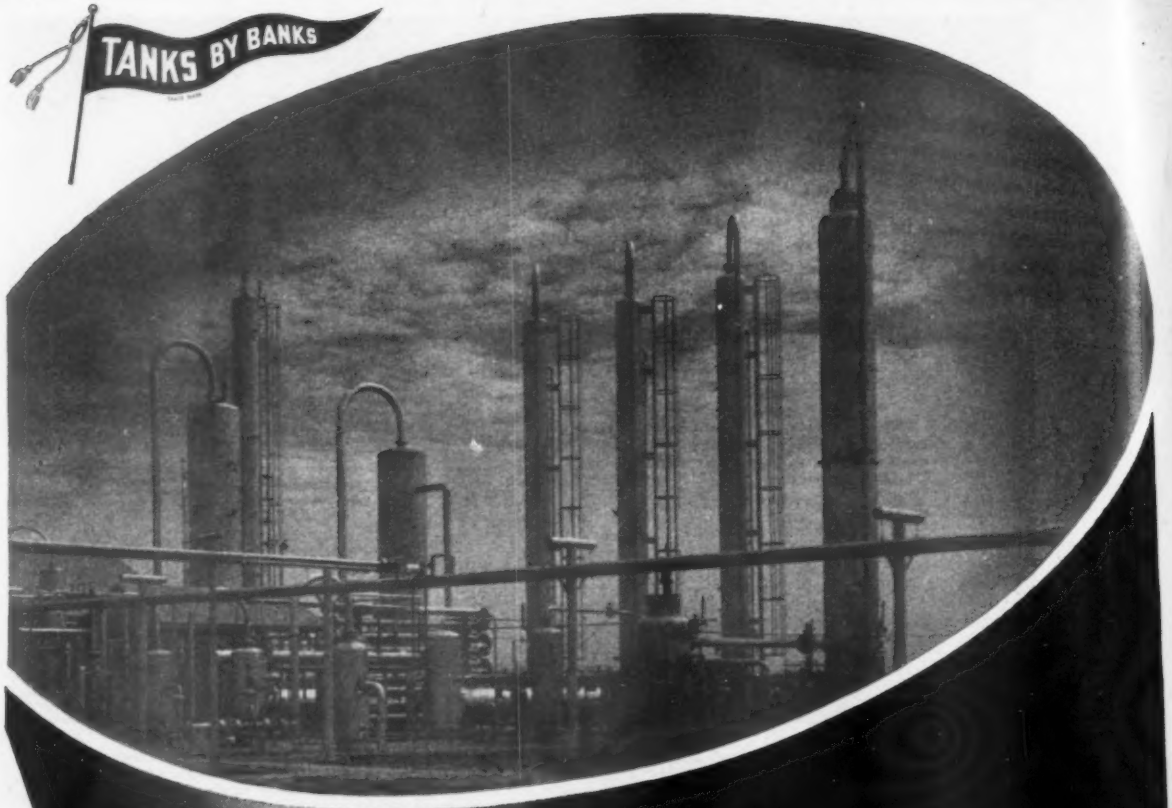
STANDARD OIL COMPANY (INDIANA)

E. L. LINSCOMB, a member of one of our drilling crews, is one of our 46,700 employees—drillers, transportation workers, refiners and marketers—who work together from the ground up to keep our thousands of independent dealers and you supplied with quality petroleum products.

RALEIGH C. HALL of Independence, Missouri, works at our Sugar Creek refinery. Like all our employees, he has back of him a big investment in tools and equipment, to help him earn a good living and to produce more for you. This is made possible by the investment of our 96,800 owners.

H. L. BRUMMER, *center*, and C. R. Waldroff, *right*, are partners in the service station business in St. Joseph, Missouri. They and thousands of other independent dealers treasure you as customers just as we do. They depend on your patronage, as we do, to grow and prosper.

TANKS BY BANKS



STEEL FABRICATORS FOR THE PETROLEUM INDUSTRY

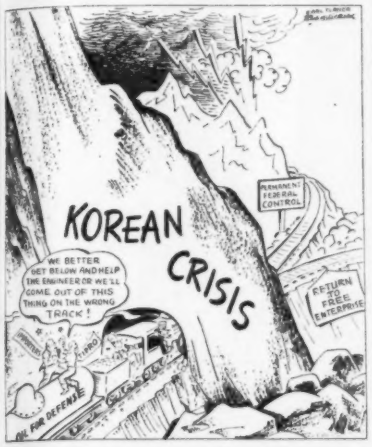
You Are Cordially Invited To Submit Your Fabrication Problems To Our Engineering Department . . .

DALLAS TANK COMPANY, INC.

201-5 W. Commerce Street • P. O. Box 5387

DALLAS, TEXAS

They Say—


KOREAN CRISIS
WE BETTER GET BELOW AND HELP THE ENGINEER OR WE'LL COME OUT OF THIS THING ON THE WRONG TRACK!
PERMANENT FEDERAL CONTROL
RETURN TO FREE ENTERPRISE
OIL FOR DEFENSE

From the TIPRO Reporter, published by Texas Independent Producers and Royalty Owners Association.

Investigation Needed

"A single fuel, such as coal, or oil, or natural gas, cannot be studied independently. Individual elements of our energy economy do not function independently any more than the steel industry operates in a manner unaffected by the economic factors which influence other metallic production such as copper or aluminum. We must view the economic environment in which our energy sources are developed and used.

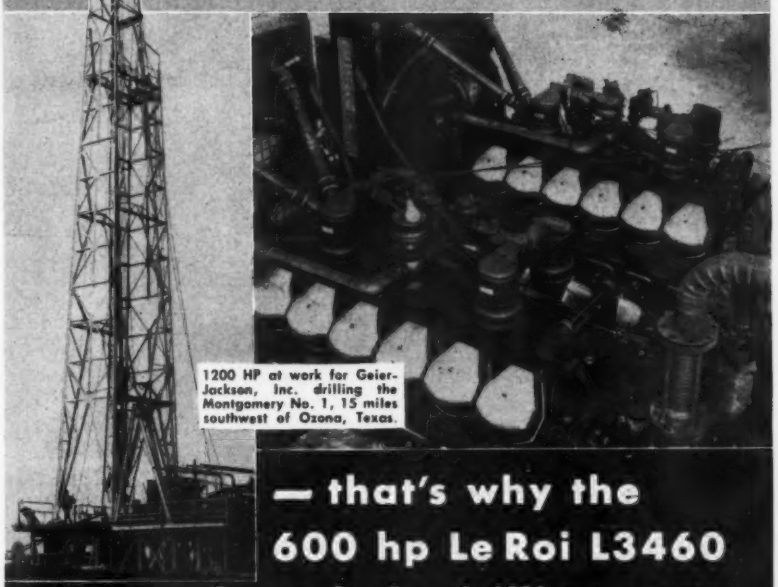
"This point becomes readily apparent when one considers the wide range of uses in which primary energy sources can be substituted, one for the other. Perhaps as much as 90 per cent of our total energy supplies are consumed in uses where substitution among at least some of the primary energy source is possible.

"Examples of uses where substitution has been important are electric utilities in which oil recently has been replacing bituminous coal; railroads, where diesel fuel has been substituting for coal; and home furnaces, where oil and natural gas have been replacing both anthracite and bituminous coal.

"The lesson of the past is that because of substitution among fuels, the problems of any energy industry cannot be studied in isolation, but only in conjunction with all other energy industries. However, the past does not tell us what the future trends in the energy industries will be. In learning from history that the energy economy is indivisible, we must not make the mistake of concluding that the past history of substitution provides an in-

LE ROI MILWAUKEE

Hair-trigger acceleration plus plenty of lugging power means faster round trips!



1200 HP at work for Geier-Jackson, Inc. drilling the Montgomery No. 1, 15 miles southwest of Ozona, Texas.

— that's why the 600 hp Le Roi L3460 cuts deep-hole drilling costs

WHEN it comes to hoisting, you can't beat the wide range of speed and flashing acceleration of the Le Roi L3460. The L3460 with its modern integral V-12 construction guarantees you better than 500 hp at 1350 rpm — more power than any other engine of its kind.

And for mud-pump service the L3460 delivers ample power — from 225 hp at 900 rpm to 450 hp at 1200 rpm. You can count on extra-long engine life at these conservative continuous-service speeds.

Le Roi's V-12 design is unquestionably the answer to demands for greater horsepower and quicker acceleration in a single, compact portable unit. Easy to service. Operates on oil-field fuels — natural gas, butane, or gasoline. See your Le Roi distributors for complete details.

Write for latest literature.

LE ROI COMPANY, Milwaukee 14, Wisconsin

New York • Washington • Birmingham • Tulsa • San Carlos

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Le Roi Company Branch — Tulsa
Carson Machine & Supply Co. — Oklahoma City

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Southern Engine and Pump Company — Houston, Kilgore, Edinburg, Dallas, San Antonio, Corpus Christi, Texas, and Lafayette, Houma, Louisiana.

North & West Texas, New Mexico
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Nortex Engine & Equipment Co.—Wichita Falls, Texas.

Kansas
Carson Machine and Supply Co.—Great Bend

Illinois — Western Kentucky
Western Machinery & Engine Company—Centralia, Illinois and St. Louis, Missouri.

Michigan
Hofer Engine Service — Reed City

Rocky Mountain Area
Gehring Equipment Co. — Casper, Wyoming, Rangeley, Colorado.

Northern Louisiana & Mississippi
Ingersoll Corporation — Shreveport, Louisiana, and Jackson, Mississippi.

West Coast
Le Roi-Rix Machinery Co. — Los Angeles, Long Beach and Bakersfield, Calif.

Appalachian Area
P. C. McKenzie Co., Pittsburgh

Canada
Lucey Export Ltd. — Calgary, Edmonton, Alberta.

Complete Sales and Service Facilities

P-101

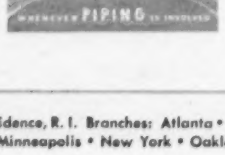
XUM

Puzzle for experts

There is no need for "cutting and trying" on the job to make a prefabricated piping sub-assembly fit perfectly. Prefabricated miles away to exact dimensions and specifications these pieces of piping are links in piping systems which may carry steam up to 2500 p.s.i. and 1050°F.

Grinnell integrates the many factors in this complex, highly technical assignment in one organization of specialists. Major economies result from this single responsibility which includes interpretative engineering, metallurgical research, compliance with code requirements, manufacturing drawings and specifications, production schedules, purchase of materials, specialized facilities, skilled personnel, control of quality and rigid inspection.

You'll find it to your own best interests to draw upon Grinnell's century-long, specialized experience in power, process and industrial piping.



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fallible guide for future changes. Nor does the simple record of the past tell us whether the economy would profit, in war or peace, if these trends were to continue unchanged into the future. To appraise the future and to provide guideposts for the development of sound energy programs and policies an investigation is required."

Secretary of the Interior Oscar L. Chapman, endorsing a Senate bill to study the coal industry.

Defense of Imports

"We believe that imports of foreign oil are to the best interest of American consumers now. It furnishes competition which helps to keep all operators on their toes and operating at high efficiency—whether they be domestic oil producers or producers of competitive products such as coal. Incidentally, we are firmly convinced that the decline in coal sales which the coal industry has been complaining about is not due to imports of oil. It is due partly to consumer preference to oil, a trend which began long before the controversy over oil imports arose, and partly to internal difficulties within the coal industry.

"We believe that the more oil this country can use from whatever source, the more rapid will be the development of our standard of living. In a period of economic growth we can use vast amounts of domestically produced oil and still need to import oil from abroad. This was proved in the 1920's, which was a period of proportionally much greater imports of oil than we have today."

Robert H. Colley, president of Atlantic Refining Co., in the Atlantic Magazine.

Our Job Now

"Now what does this decision—the present fighting in Korea and the police action we will probably have to take again in the future, now that we have assumed world leadership—mean to us here at the refinery. What are our responsibilities?

"During World War II we took the slogan, 'Oil Is Ammunition'—it is again today! Our company products fought in World War II at far-flung outposts. They kept equipment battle-worthy and we all contributed in our way to victory.

"At the same time, we kept the wheels of transportation moving at home, helped industrial production to reach miraculous peaks, aided the farmer to toil and feed us and our needy allies.

"We must again do this same staggering double-front job—and keep doing it. How? By producing in quantity and quality, as economically as possible. This is one big order! But it can be done, if all of us are willing and anxious to do our part."

Editorial in the Refinery News published by the Bayonne Refinery of Tide Water Associated Oil Co.

How to meet a payroll (at a cost of $3.19)

Twenty-four hours before factory payday, another check-writing machine was needed *fast*. At 10 A.M. plant manager ordered one from supplier 400 miles away. He specified Air Express, the service regularly used to keep production rolling. 26-lb. carton delivered same day at 2 P.M.—in time! Shipping cost only $3.19!

$3.19 was total cost—and *included* door-to-door service! Air Express is the most convenient way for you to ship or receive—in addition to being the world's fastest transportation method.

You get round-the-clock service with Air Express. Shipments go on all flights of the Scheduled Airlines. Air Express is service you can *count on* to keep your business rolling in high gear.

Air Express gives you all these advantages

World's fastest transportation method.
Special door-to-door service at no extra cost.
One-carrier responsibility all the way.
1150 cities served direct by air; air-rail to 18,000 off-airline offices.
Experienced Air Express has handled over 25 million shipments.

Because of these advantages, regular use of Air Express pays. It's your best air shipping buy. For fastest shipping action, phone Air Express Division, Railway Express Agency. (Many low commodity rates in effect. Investigate.)

Rates include pick-up and delivery door to door in all principal towns and cities

A service of Railway Express Agency and the **SCHEDULED AIRLINES of the U.S.**

1/4" 5/16" 3/8"
1/2" 5/8" 3/4"
and 7/8" capacity

Electric Drills

powerful! cool running! light weight!

15 MODELS . . . A TYPE AND SIZE FOR EVERY JOB

Whatever your drilling requirements — occasional small jobs — general intermittent operations or continuous heavy work — Snap-on can furnish the best drill to fit your purpose. Superior features include heavier and more powerful motors than many competitive tools of similar chuck capacity . . . extremely efficient cooling . . . helical gears throughout . . . all ball bearing construction permanently lubricated and sealed from dust and grit . . . heavy duty Jacobs chucks . . . extra long (15 feet) heavy 3-conductor cable treated to withstand oil, grease and wear. Shipments made promptly from Snap-on branch offices located in 40 key industrial cities . . . write for complete catalog.

Blue-Point general purpose, straight shank, high speed drills available in fractional sizes from 1/16" to 1/2"; Wire Gauge Drills from No. 1 to No. 60.

SNAP-ON TOOLS CORPORATION

8098-I 28th Avenue
Kenosha, Wisconsin

State Regulation Best

"Experience has demonstrated that state laws and regulations providing necessary incentives and proper conservation practices, together with close-at-hand state administration, encourage the risk-taking vital to the discovery and development of petroleum resources, a matter essential to the military security and economic well-being of the nation. On the other hand, federal laws and regulations with final authority remote from the scene of operations have tended to retard and discourage exploration for oil underlying federal lands. The chamber is, therefore, in opposition to all proposals for federal acquisition or control of known or potential oil-producing areas which are now administered by the several states."

Chamber of Commerce of the United States in a booklet on natural-resource policy.

The Job Ahead

"In World War II we stood helplessly by while better-organized segments of the economy jockeyed around us for more favorable treatment by pressure-conscious federal agencies. While our costs of production climbed out of reach, crude-oil prices remained where frozen. In helpless alarm we watched more than 50 per cent of our desperately needed oil-field steel products go abroad without justification, while we produced our wells close to the danger point.

"Unable to keep up our exploration and drilling obligations, we saw our industry become the object of all sorts of threatening federal investigations when the inevitable period of near-short supplies came on after the war. Exploited to the maximum by advocates of federal control, this situation gave rise to widespread public belief that America was 'running out of oil' and must rely upon foreign production.

"Our problem today, the issue we must face if we are to survive another period of wartime controls, is how to prevent a recurrence of such near-disastrous chain of mistakes."

R. L. Foree, president, Texas Independent Producers and Royalty Owners Association.

High Calling

"Birthdays are times when we must look ahead to the future and to the opportunities and privileges which will be ours to continue our high calling in the service of the public.

"I am sure that in looking ahead we will all join in a firm resolve to carry forward the work which the generations of employes of our company in the past have advanced so far and so well."

President James F. Oates, Jr., keynoting the one hundredth anniversary of Peoples Gas, Light & Coke Co., Chicago.

XUM

XUM

when time is money!

Drillers and production men look to

ENSIGN CARBURETION

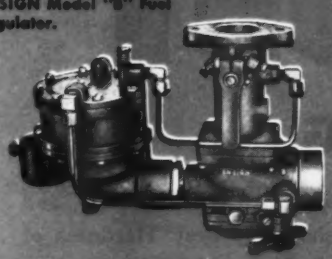
for DEPENDABLE low cost

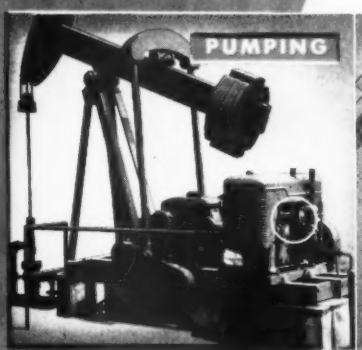
GAS ENGINE PERFORMANCE

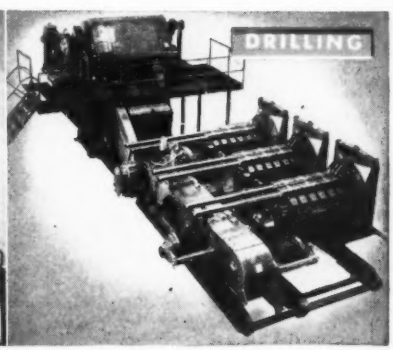
With every well drilling operation boiled down to a split second, there's little excuse nowadays for an unscheduled shut-down due to drilling engine failures. Gas engines provide DEPENDABLE and ECONOMICAL 24 hour service with the least maintenance. Good performance depends largely upon the carburetion, which in the case of over 90% of all gas engines is ENSIGN. Over 38 years of carburetor experience are designed into the simple and rugged Ensign models used on todays engines. Operators everywhere have learned to count on gas engines equipped with ENSIGN.

ENSIGN Model "Kgnl" combination Carburetor for use with Natural Gas, Butane-Propane or Gasoline.

ENSIGN Model "Kgl" Straight Gas Carburetor for either Natural Gas or Butane-Propane and ENSIGN Model "B" Fuel Regulator.







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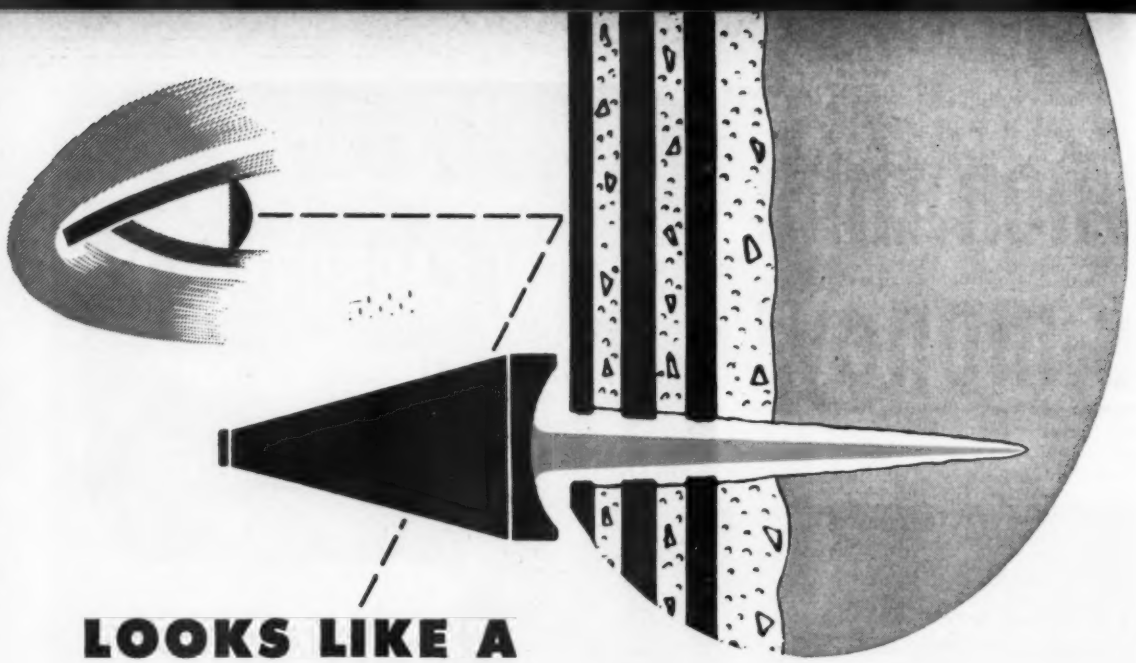

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JOURNALLY Speaking

Look Twice

LOOK twice when you open the envelope with your Journal in it next week. You won't be seeing double. There will be two—count 'em, two—maps folded into the book.

One is a new map of the crude-oil and petroleum-products pipe lines in the United States and the other is a map of all the natural-gas pipe lines. They are just two of the many features of our annual pipe-line issue.

For many years we have been alternating these maps, oil lines one year, gas lines the next, because there are so many of both kinds of lines that a map of both would be too crowded to read. During the past couple of years the construction of new pipe lines for both oil and gas has been proceeding at such a pace that we figured our readers needed up-to-date copies of both maps. Besides, these maps are always so popular that we sell out of extra copies within a few months and of late we have not been able to fill requests.

So we decided to do a double take this year and get ourselves and our readers up to date. Always striving to please.

But if you're not the person who opens the envelope, trace back the routing slip and hunt for those maps, because the chances are that the top man on the list snitched them out and kept them. However, there is no use fighting over them. Flip a coin to see who pays for a second set; our Reader Service Department will be delighted to supply extras at $2.50 each.

Live and Let Live

WE are glad to note that a compromise had been worked out among West Coast oil interests, the U. S. Forest Service, the Interior Department, and the Audubon Society which will permit exploration for oil without disturbing the last remaining sanctuary of the nearly extinct California condors.

There are only about 60 of these enormous birds left in the world and they have holed up in Los Padres National Forest in Ventura County, and when oil men sought drilling permits in the area the bird lovers rose in alarm. Under the compromise the federal men will locate access roads away from the condor's habitats and the oil men agreed to be as quiet as possible and not drill within half a mile of any nest.

Here is a case where compromise clearly was in order. The oil industry has nothing against condors nor any other wonder of nature, but if drilling were prohibited wherever a derrick might mar the face of the landscape or disturb the ecology of the wild life, oil wells would be about as rare as condors.

Ice Well

ADD polar exploration to the sciences benefitting from the oil industry and its wondrous equipment. The American Geographical Society is now using an oil-well survey instrument to measure the drift of the Juneau ice cap in Alaska.

This summer the party is drilling a hole 600 ft. into the glacier and casing it with aluminum pipe. It proposes to measure the vertical deviation of the hole at various depths by an instrument which does the same thing in an oil well. Next summer the party will go back and take another set of readings in order to calculate the rate of flow and direction in which the ice moves at different levels.

Eastman Oil Well Survey Co., which developed the gadget, got so interested in the project that it loaned an instrument without cost. Incidentally, it hopes to benefit by testing the performance of its instrument under extremely low temperatures, since ordinarily it is called on to perform under the intense heats of deep oil wells. This may or may not presage the development of oil in the Arctic.

—*Henry D. Ralph*

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In This Issue

News

Federal Agencies Setting Up Organizations Under Defense Control 63
Labor Department Revives Proposal for Refiners' Minimum Wage 64
"Siesta Psychology" Charged by Committee on Preparedness 65
Repricing Legislation Shelved by Congress; Act Believed Dead 66
Low-Pressure Gas Injection Planned for Watkins Lime Field 66
Good Production Found in Old Skellyville Field of Oklahoma 67
Wildcat May Give Oregon Its First Commercial Oil Production 67
California's Crude Production Reaches 902,300 Bbl. Daily 68
Louisiana Tidelands Production May Total 6,000,000 Bbl. Next Year 68
Producers Finding Many New Uses for L.P.G. 69
Plans Being Completed for Oil Progress Week 70
Caltex Refuses to Deliver Oil Products Under ECA Order 72
Development of Brazilian Shale Oil Not Feasible, Standard Says 73
Advance Work Starts on New Venezuelan Pipe Line 74
Work Begins on British Refinery; Vacuum Merges with Cory Bros. 74
Britain's Catarole Petrochemical Plant Faces Refinancing Crisis 76
Trieste Refinery Expands 76
Haifa Refinery Resumes Operations at About Fifth of Its Capacity 78
Filipino Mission Seeking Refinery to Stir Its Industry 78

Engineering-Operating

Thirty-Five Rigs Drilling in Ringwood Field 84
Book Reviews 90
New Method for Measuring Seismic Velocities 92
Questions on Technology 100
Flexible Clay Treating and Vacuum-Distillation Unit 102
Tapline Pipe Layers Surmount Problems in Difficult Terrain 109
Composite Electric Logs in Central and North Central Oklahoma 128
Engineering Fundamentals—Gravity Drainage 131
Refiner's Notebook—Adjustment of Derivative Controller 133
Oil and Gas Equipment Digest 135

Exploration-Development

Wyoming Operators Get a Break 155
Highlights of Week's Developments 155
Reports by Areas Start on Page 157

Departments

They Say 51
Journally Speaking 57
Editorial 61
This Week 62
Watching Washington 65
International News 72
Personals 80
Deaths in the Industry 83
Pipe-Line News 140
On the Line 142
Natural-Gasoline News 147
Natural-Gas News 147
Drilling Contractors 149
Refining News 152
Exploration Statistics 172
Production Statistics 173
Refining Statistics 174
Market Statistics 175
Equipment Men in News 176
Classified Advertising 178
Calendar of Events 182
Advertisers' Index 182

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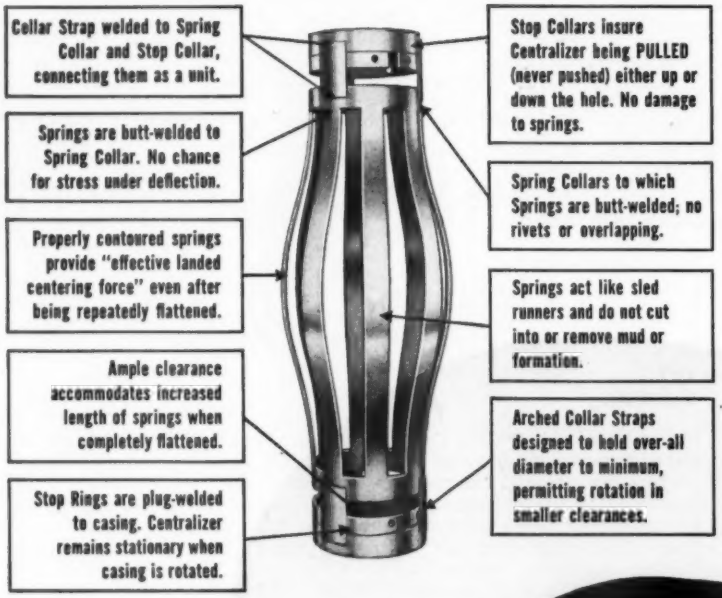
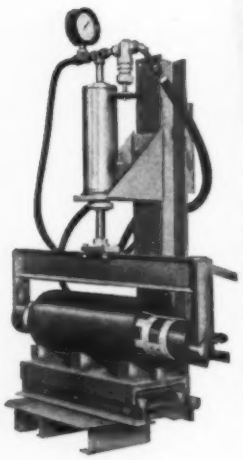

Collar Strap welded to Spring Collar and Stop Collar, connecting them as a unit.
Springs are butt-welded to Spring Collar. No chance for stress under deflection.
Properly contoured springs provide "effective landed centering force" even after being repeatedly flattened.
Ample clearance accommodates increased length of springs when completely flattened.
Stop Rings are plug-welded to casing. Centralizer remains stationary when casing is rotated.
Stop Collars insure Centralizer being PULLED (never pushed) either up or down the hole. No damage to springs.
Spring Collars to which Springs are butt-welded; no rivets or overlapping.
Springs act like sled runners and do not cut into or remove mud or formation.
Arched Collar Straps designed to hold over-all diameter to minimum, permitting rotation in smaller clearances.

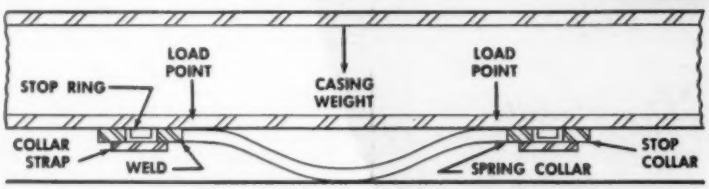
EASY STARTING WITHOUT "SNUBBING"

Testing to determine the maximum number of springs, of optimum bowed height and length, to insure easy starting, particularly of the first few joints when there is no accumulated weight. Minimum interval spacing of Baker Model "G" Casing Centralizers also was determined with this testing equipment.



With this testing device it is possible not only to simulate rugged downhole travel by repeatedly flattening the springs, but also to find the effective centering force of the centralizer in the open hole, after such treatment. The maximum centering force is easily determined from a performance curve showing the centering force at various intervals of deflection.

Operators who know ALL the facts about the Baker Model "G" Casing Centralizer specify and run them exclusively. They know from experience that they are buying the greatest possible centering force for their casing, to be applied *exactly where they want it in the hole.* Isn't that what you too expect and really want from a casing centralizer?



Here is the ideal in spring design and mounting, found only in the Baker Model "G" Casing Centralizer. Note how the load point is imposed directly upon the casing; and how the properly "contoured" spring is free to move along the smooth surface of the casing as it deflects under compression. There is no chance for concentration of stress to cause a permanent set, or to result in breaking of the spring. Note that ample clearance exists between Stop Rings and Spring Collars to accommodate the increased length of the springs which results from their complete flattening.

Additional interesting facts and illustrations are contained in a new 16-page brochure which proves conclusively that no other spring-type centralizer even approaches the EFFECTIVE LANDED CENTERING FORCE afforded by the Baker Model "G" Casing Centralizer. Ask for your copy today from any Baker office or representative.

BAKER OIL TOOLS, INC.
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Watch Propane

A youngster in the petroleum-products family which is showing definite signs of outgrowing its knee pants and demanding a seat at the first table is liquefied petroleum gas, or propane-butane.

The oil industry is, of course, well aware of the rapid growth of "bottled gas" for cooking and heating in rural and suburban homes during the past 20 years and its more recent popularity for chemical manufacture and for enriching manufactured gas and supplementing natural gas in city mains.

Now L.P.G. threatens to invade the cream of the products market—motor fuel. For some time it has been there, in disguise, as a blending agent in gasoline manufacture, but it appears to be no longer satisfied with this stepchild role and is striking out for itself.

During the past summer the number of farm tractors converted from gasoline to propane-butane has been amazing. No figures are available, but manufacturers of conversion units and distributors of L.P.G. are unable to keep up with the trend. More recently propane has received initial acceptance as fuel for city transit buses.

The volume of gasoline displaced by propane and butane to date probably is very small in the national total. It is the trend which is important. Here is a product which once was wasted or put to inferior or secondary uses but which now bids for the petroleum industry's top market.

As a motor fuel propane gives more miles per dollar than gasoline at present prices, has little or no exhaust odor, gives high-octane performance, and deposits no carbon or sludge in the motor. If vehicles were designed throughout to operate on propane there would be even greater economies.

It is interesting to note that the big automotive manufacturers hesitated to build propane vehicles for fear their use would be limited to a few areas, and the big L.P.G. producers hesitated to promote propane as a motor fuel for fear of offending their refiner customers. But, private industry being what it is, small companies began making conversion units and independent L.P.G. distributors began pushing their use. Now the big companies are very definitely interested in this development.

In many parts of the Southwest there already are sufficient distributors of L.P.G. to permit propane-powered private cars and intercity trucks and buses to refill whenever needed. It has been estimated that the average filling station could install propane-dispensing equipment with an increase of only about 20 per cent in its investment. Other studies indicate that the petroleum industry is now marketing only about one-fifth of the propane potentially available.

All this looks like a natural setup for a tremendous expansion. There can never be enough propane to take a major portion of the motor-fuel market, but over a period of years it could take important slices of it. Keep your eye on propane.

THIS WEEK

CONTROLS—Defense Production Act becomes law. . . . Federal agencies now perfecting plans to administer controls. . . . ¶President creates two new agencies to guide war production and economic stability. . . . ¶Interior Department gets priority and allocation powers over all phases of petroleum industry. . . . ¶Commerce Department starts setting up plan for allocation of steel. . . .

PRODUCTION—Oregon may become an oil state as operators claim wildcat capable of commercial production. . . . ¶Louisiana's offshore oil fields scheduled to produce 6,000,000 bbl. during coming year. . . . ¶California's crude output now over 900,000-bbl. mark, believed close to top potential. . . . ¶Reworking of old Oklahoma fields finds productive pays passed up in original drilling. . . . ¶Repressuring program starts in Watkins field in Texas Panhandle. . . .

WASHINGTON—Congressional committee criticizes administration for slowness in stepping up synthetic-rubber program. . . . ¶Bill to permit renegotiation of price of crude oil refined into government products appears dead for this session. . . . ¶Labor Department seeks to set federal minimum standards for refinery wages. . . . ¶Bureau of Mines expected to get authority to expand synthetic-fuels program. . . . ¶Senator wants investigation of possibility of an oil shortage. . . .

CANADIAN RUBBER.—Framed in the elevated pipe supports is the butadiene-concentration section of the synthetic-rubber plant of Polymer Corp., Ltd., owned by the Canadian Government. It has operated steadily since the war and this year will top its record with an expected output of 100 million pounds of petrochemicals. Located at Sarnia, Ont., the plant utilizes petroleum fractions from the adjacent refinery of Imperial Oil, Ltd., but its capacity will be increased in December by an additional supply of light fractions from the 125-mile pipe line from Toledo nearing completion by Sun Oil Co.

INDUSTRY—Spread of new uses of L.P.G. amazes industry. . . . Thousands of tractors have converted to propane-butane, and use in buses is being promoted actively. . . . Miscellaneous uses hold interest. . . . ¶Oil industry perfects plans for nation-wide participation in Oil Progress Week October 15-21. . . .

ACTIVITY—Crude production for week ended September 9 averaged 5,826,025 bbl. daily, up 144,100 bbl. daily from previous week to set another all-time record. . . . ¶Completions for the week totaled 850 wells compared with 832 for previous week. . . . Wildcat completions gained 14 wells to 169 for the week. . . . ¶Rotary rigs operating in United States on September 4 totaled 2,177 rigs, off 32 from previous week but a gain of 246 over same date in 1949. . . .

TRENDS—An increase in crude-oil inventories is indicated for September. . . . ¶Production of crude and field condensate is expected to average about 5,885,000 bbl. daily. . . . ¶Crude imports are running about 490,000 bbl. daily. . . . Crude exports and transfers will be near 125,000 bbl. daily, leaving 6,250,000 bbl. daily available for refinery runs. . . . ¶If runs average 6,150,000 bbl. daily, stocks will be back to 240,000,000 bbl. before the end of the month. . . .

INTERNATIONAL—ECA order cutting price of Middle East oil sold to Europe meets protests from companies. . . . Caltex refuses to make deliveries. . . . ¶"Aquila" firm expanding Trieste refinery and distribution facilities in Italy. . . . ¶U. S. loan to Mexico unconfirmed but believed imminent. . . . ¶Haifa refinery resumes operation but source of crude is uncertain. . . . ¶Preparations begin for construction of new pipe line for Lake Maracaibo crude. . . .

PIPE LINES—Ownership of Sun-Yount Lee pipe line in East Texas acquired by Sun Pipe Line Co. (Texas). . . . Extension completed connecting system with Mid-Valley Pipeline Co.'s 1,000-mile crude-oil line. . . . ¶Pan American Pipe Line Co.'s new crude-oil line from Scurry County fields dedicated at ceremonies in Snyder, Tex. . . . ¶Final work under way on Trans-Arabian Pipe Line Co.'s line from Persian Gulf to Mediterranean Sea. . . .

NATURAL GAS—June operating revenues of natural-gas companies reporting to FPC increased 25.4 per cent over the same month a year ago. . . . Income up 50.5 per cent. . . . ¶Tennessee Gas Transmission Co. offers to exchange its stock for that of Sterling Oil & Gas Co. on a basis later to be determined. . . . T.G.T. owns 40 per cent of Sterling's outstanding common stock. . . .

NATURAL GASOLINE—Underground storage of L.P.G. approved for Keystone field of Winkler County, Kansas. . . . ¶Oklahoma Natural Gas Co. acquires 26 per cent interest in Garvin County, Oklahoma, plant system from Carter Oil Co. . . .

Defense Production Act

Now that it finally has become law, federal agencies are preparing to start administering their powers of control

Bertram F. Linz

WASHINGTON. — Federal agencies which will have first whack at wartime control of industry were busy this week setting up the organizations through which they will administer those authorities delegated by the President under the new Defense Production Act.

There was considerable speculation over whether industry men would be brought in to head various activities, as they were during the last war, and it is known that many of those who served in key capacities following Pearl Harbor have been in Washington recently talking the situation over with White House and other officials.

For the oil industry, interest centers around the setup to be developed in the Interior Department, which will have control of fuels, and Secretary Oscar Chapman recently invited Ralph K. Davies, Deputy Petroleum Administrator for War under Harold L. Ickes, to Washington for a talk.

Reportedly, Davies was offered a post as Undersecretary but indicated he did not feel able to serve, although there were suggestions he would accept if the matter were seriously pressed, and Chapman now is understood to be canvassing the men who held key positions in PAW.

Oil setup.—There is one vital difference between the current setup and that developed in the last war. Then, after considerable intramural wrangling, PAW was set up as an independent agency, although it was tied to the department by the fact that Ickes served as head of both. Now, under President Truman's policy, oil control and the other responsibilities of PAW will be handled entirely within the department setup.

Currently, Assistant Secretary C. Girard Davidson is in charge of the Oil and Gas Division, the Bureau of Mines, and Geological Survey, and reportedly would like to be top man in the control organization, which he would not be if an oil man were brought in as Undersecretary, but the industry would feel more secure if the controls which may be imposed in the future were in the hands of an experienced oil man.

Given the green light by President Truman, Interior can enter upon a broad field of control and direction of the oil industry. There are a number of products which will be in short supply—some are already short—of which the department could order refiners to step up output. It could limit the use of other products, such as alkylate in gasoline; it could control the use of steel, in cooperation with the Commerce Department; and it could set up an allocation program for any oil product as supplies shortened. In short, the department could do almost anything PAW was able to do, and evetually may have to.

Powers Outlined. — All the powers necessary for a broad control of the whole economy were granted in the Defense Production Act, which can be summarized as follows:

The President is authorized to establish priorities, require the performance of defense contracts, and allocate materials and facilities. Penalties are provided for hoarding in excess of the "reasonable demands of business, personal, or home consumption."

The President, when all other methods fail, is authorized to requisition supplies, materials, and facilities, the owner to be paid 75 per cent of the Government's estimate of the value of the property and privileged to sue for the remainder in the federal courts. Such property, however, could be returned to the owner upon payment of its fair value.

Various government departments and agencies, operating through the Federal Reserve System, could guarantee public or private loans to expedite production and deliveries under national defense contracts, purchase metals, minerals, and other raw materials, and install additional equipment in government facilities and install government equipment in private plants.

Price control.—The President is authorized to encourage voluntary action to bring about wage and price stabilization, but if such action fails he has the power to impose price ceilings, either piecemeal or generally, but at the same time must stabilize wages. Ceilings can be established, however, only when the President finds that a price has risen or threatens to rise "unreasonably" above the level of May 24-June 24, 1950, when such increases will materially affect the cost of living or the national defense, when the ceiling is necessary to affectuate the purposes of the act, and when it is practicable and feasible to impose such a ceiling. Such a ceiling must be generally fair and equitable to sellers and buyers of materials and to sellers and buyers of related and competitive materials.

Whenever ceilings have been established on materials and services comprising a substantial part of all sales at retail and materially affecting the cost of living, ceilings shall be imposed generally and wages, salaries and other compensation stabilized at the same time. In stabilizing wages, the President is required to prohibit wage increases which would require an increase in the price ceiling or impose hardships or inequities on sellers.

The President would be prohibited from eliminating or restricting the use of brand or trade names, requiring grade labeling, or standardizing materials.

New agencies.—While other powers may be exercised through existing federal agencies, across-the-board price and wage controls will have to be administered through a new independent agency to be created for the purpose.

Allocations of materials that will result in a significant dislocation of the normal civilian distribution must be handled in such way that each segment shall receive a fair share.

Antitrust exemptions are provided for actions taken under voluntary programs at the request of the President upon consultation with representatives of industry, business, finance, and other interests, and any rule, regulation, or order issued under the legislation must be accompanied by a statement that consultation had been had with industry representatives and consideration given to their recommendations.

One of the first projects to be considered under provisions for government assistance in the construction of facilities is expected to involve benzine, of which there is a serious shortage. Interior officials are plugging for a $325,000,000 plant to produce about 35,000,000 gal. of benzine and 120,000,000 gal. of other aromatics from coal, but members of Congress from the southwest are demanding that the plant be built in Texas to produce from oil.

Action.—As he signed the bill, President Truman issued executive orders creating two new agencies, an Economic Stabilization Agency to handle price and wage controls, when needed, and a National Production Authority to administer priorities and allocations and to be set up in the Commerce Department.

The President's order gave the Interior Department priorities, allocation, and other powers over petroleum and natural gas, including pipe lines, and also made it a "guarantee-

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ing agency" to sponsor financial or other assistance designed to expand productive capacity and production of materials and facilities necessary for the national defense.

Activities of the various agencies which will have parts in the program will be coordinated by National Security Resources Board Chairman W. Stuart Symington, one of whose jobs will be to resolve interagency controversies which otherwise would require the attention of the President.

Commerce Secretary Charles Sawyer immediately issued an order setting up an advisory committee on priorities administration composed of representatives of the various departments which will have priorities authority, which will recommend programs for the production and allocation of scarce materials.

Sawyer announced he would confer immediately with steel executives on a voluntary allocation program and would follow up with similar meetings with other industries.

As a first step toward eventual price control, the President issued an order requiring all persons selling or offering goods or services during the period between May 24 and June 24, 1950, to preserve all records pretaining to the prices received or asked for such goods or services, and the labor, material, acquisition, and other costs incurred in connection witb them.

Synthetics Extension Due

WASHINGTON. — Probable final congressional approval in the short time remaining of this session of the 3-year extension of the Bureau of Mines synthetic-fuels research program was indicated when the Senate committee reported favorably the House-passed bill for this purpose.

Under present law the synthetic fuels program would expire April 5, 1952. Besides giving it a 3-year extension, the bill boosts the total of authorized expenditures to $87,600,000 from $60,000,000.

Noting that the authority to conduct this program expires in 1952, Interior Secretary Chapman wrote the Senate committee that "to benefit fully from the large investment already made in this field, it is necessary that the authority under the act be extended, and the research be continued beyond the present expiration date."

Wage Law Revived

Labor Department seeks minimum pay for refiners

WASHINGTON.—The Labor Department has revived its proposal to establish a minimum wage for refinery workers under the Walsh-Healey Public Contracts Act, which provides for minimum wage, hour, and certain other stipulations on government-supply contracts of over $10,000.

The department has called a meeting of the oil-industry labor-management panel for September 26 to discuss methods of making a survey to determine a definition of the industry.

Industry representatives who have been following the matter see in the department's move an effort to develop a minimum wage of at least $1 an hour in plants producing for the Government, on the basis of which it can at some future time ask Congress to make that figure the minimum under the Fair Labor Standards Act. The department sought the $1 minimum in the last amendment of the general minimum-wage law, but Congress refused to go above 75 cents.

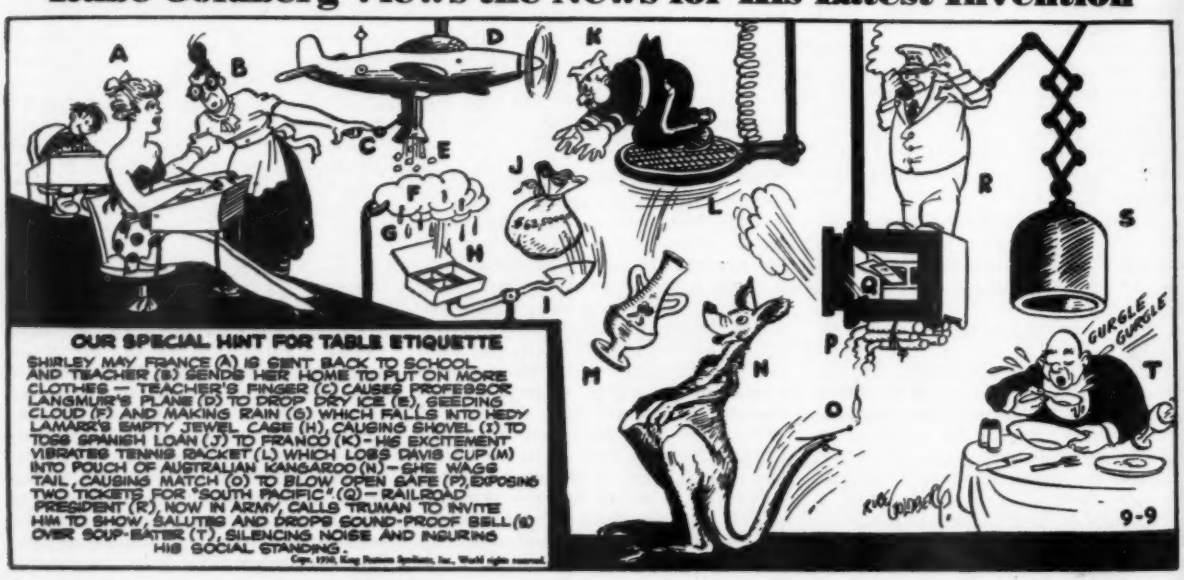
Under the Walsh-Healey Act the department has the authority to set the minimum wage to be paid by government contractors and has set the figure for a number of industries, but never heretofore for the refining industry. There is no requirement that the secretary consult with industry in taking such action, but it has been the general policy to rough out a plan in consultation with industry panels and later to hold public hearings, and it is indicated that procedure will be followed in this instance.

Meeting held in April.—The proposal to establish a minimum wage for the refining industry was broached early this year and a meeting was held with the industry panel last April, after which the matter lapsed until recently. One of the first difficulties encountered was in connection with a definition of the industry, with refinery representatives arguing that it should cover products made both by refiners and by the chemical industry, such as insecticides. The department apparently has solved the problem by deciding that such products shall be considered as part of the chemical industry since their manufacture requires a process beyond the actual refining of crude oil even though of no more complexity than the addition of a poison to kerosine.

In addition to being a back-door approach to another increase in the general minimum wage, industry representatives see in the department's plan a threat to the small refiners, who will have to pay the higher wages prevailing in the plants of the major companies.

The wage-hour division of the de-

Rube Goldberg Views the News for His Latest Invention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9-9
OUR SPECIAL HINT FOR TABLE ETIQUETTE
SHIRLEY MAY FRANCE (A) IS SENT BACK TO SCHOOL AND TEACHER (B) SENDS HER HOME TO PUT ON MORE CLOTHES — TEACHER'S FINGER (C) CAUSES PROFESSOR LANGMUIR'S PLANE (D) TO DROP DRY ICE (E), SEEDING CLOUD (F) AND MAKING RAIN (G) WHICH FALLS INTO HEDY LAMARR'S EMPTY JEWEL CASE (H), CAUSING SHOVEL (I) TO TOSS SPANISH LOAN (J) TO FRANCO (K) - HIS EXCITEMENT VIBRATES TENNIS RACKET (L) WHICH LOBS DAVIS CUP (M) INTO POUCH OF AUSTRALIAN KANGAROO (N) — SHE WAGS TAIL, CAUSING MATCH (O) TO BLOW OPEN SAFE (P), EXPOSING TWO TICKETS FOR "SOUTH PACIFIC" (Q) — RAILROAD PRESIDENT (R), NOW IN ARMY, CALLS TRUMAN TO INVITE HIM TO SHOW, SALUTES AND DROPS SOUND-PROOF BELL (S) OVER SOUP-EATER (T), SILENCING NOISE AND INSURING HIS SOCIAL STANDING.

WATCHING WASHINGTON

Bertram F. Linz

Steel Outlook

Steel supplies will come under federal control at a time when the market already is as tight as a drumhead and confused by weeks of jockeying on the part of consumers attempting to lay in supplies against inevitable allocation.

The situation makes it difficult to judge what the effect will be on steel-using industries not directly tied into the war effort, particularly in view of conflicting arguments from Washington that military demand will and will not take a substantial proportion of the steel industry's output.

Actually, it is safe to assume that whatever steel is required for military production will have to come out of what otherwise would go to civilian use. This is based on the fact that when military orders for World War II began to pile up in 1940 the steel industry was operating at an average of 64.5 per cent of rated capacity, but when South Korea was invaded the industry, with a capacity 20 per cent above that of a decade ago, was working at 100 per cent and 99 per cent of the output was for peacetime use.

In addition, there is reason to believe that military production is getting under way much quicker than had been anticipated, and the steel mills already are preparing to produce armor plate for the tank program and stainless steels for airplanes.

Because of these factors and the administration's desire to keep civilian production rolling with as little interference as possible, it is expected that allocation authorities will carefully screen all requirements. This may mean that estimates of oil-industry needs will be sharply scrutinized and it is in this field that inventory control may be exercised strictly.

Fragmentation

Fear of the atom bomb hangs heavy over the national capital and may accomplish what politicians have been unable to do over the past century or more—scatter the government agencies to the four winds.

The first steps in what may develop into a multibillion-dollar plan for taking the threat of attack off Washington were disclosed last week when President Truman asked Congress to appropriate $140,000,000 to partially decentralize the Government.

Fearful that an enemy air assault might disrupt the Government, it is proposed to move vital records and activities to points within a radius of 10 to 50 miles of Washington, but some members of Congress do not believe that is far enough and would have key agencies scattered all over the country.

Details of the program have not been disclosed, but initially only four key agencies would be moved. The over-all plan, however, calls for the moving of all or parts of 10 to 12 additional agencies whose destruction or damage would seriously affect the conduct of a war. These agencies would include the military departments, Federal Bureau of Investigation, certain Commerce and Treasury Department bureaus; and National Security Resources Board. There is no indication that the oil activities of the Interior Department would come under the heading of critical operations.

For more than a century, members of Congress from time to time have sought to have the capital moved from Washington and they lost no time in using the President's proposal as a springboard for suggestions that the agencies to be moved should be located in their districts, some as far away as the Pacific Coast. But one or two had the temerity to suggest that it might be more sensible to spend enough money to defend the country from air attack.

Why Korea

Selection of Korea as a point at which communist aggression should be resisted may have been based on realities as well as ideals, for that little-known peninsula off the coast of Asia is an area of considerable interest to Russia.

In fact, as long ago as 1896, according to National Geographic Society records, Russia and Japan engaged in a little intrigue which had as its aim a possible division of Korea along the 38th parallel which now divides the country between communist and democratic control.

Russia's interest in Korea is based on the fact that here are to be found many vital minerals of which the USSR is short—tungsten, molybdenum, cobalt, and manganese, mostly produced south of the dividing line; graphite, of which one-third of the world's supply came from Korea before the last war; barite, coal, gold, nickel, zinc, titanium, and phosphate, among many others.

partment last week also went into complaints on regulations issued under the amendatory legislation enacted by Congress last January on contributions by employers to welfare, profit sharing, and thrift and savings plans. Under the amended law, such plans must conform to regulations and interpretations of the department in order to be excluded from computations of overtime pay, and protests were received that in some respects the department's requirements differed from those of the Internal Revenue Bureau, which passes on such plans for exemption from tax.

It is expected that as a result of the present hearings, the department's regulations will be modified to bring them more nearly into conformity with those of the bureau. The points on which the oil industry objects to the present regulations were presented at the hearings by H. Ober Hess, representing Atlantic Refining Co., Philadelphia, and James R. Tritschler, counsel for Standard Oil Co. (Ohio).

Preparedness Flayed

'Siesta psychology' is charged by committee

WASHINGTON.—A congressional committee investigating our preparedness for war charged last week that the same languor which made Pearl Harbor possible in 1941 is again being displayed in official quarters, specifically with respect to the disposal of surplus military items and plants and in the development of a strategic stockpile of rubber.

The Senate armed services preparedness subcommittee, successor to the Truman committee of the last war, found that despite prodding the Defense Department has developed no definite policy governing the disposal of plants and equipment which were surplus a few months ago but now might become vitally important.

The subcommittee was particularly acid over the "siesta psychology" which it said was evidenced in building up a stockpile of rubber, and most sharply criticized the Munitions Board for recently lowering, rather than raising, the rate of acquisition.

Rubber plants reactivated.—As the Senate group castigated defense officials for their alleged "business-as-usual" attitude, the Reconstruction Finance Corp., which a few weeks ago ordered the reactivation of synthetic-rubber plants which would increase the annual output by some 88,000 tons, announced that plans are being made for reactivation of one unit in each of the two government-owned alcohol-butadiene plants at Kobuta, Pa., and Louisville, Ky., and the necessary copolymer plant capacity to produce at least another

80,000 additional tons a year of GR-S rubber.

These facilities, together with the plants now in operation and in process of reactivation, RFC reported, will put the government production of synthetic rubber on a scale of approximately 755,000 tons a year.

An interim report by the Senate group disclosed that it had found it necessary to intervene, eventually securing the support of President Truman, to halt the sale to private interests of a government-owned rubber plant in Akron, Ohio.

Repricing Shelved

Bill is one of several delayed in Congress

WASHINGTON.—New legislation governing the renegotiation of military contracts has quietly been shelved, it was learned this week. As originally written, the legislation would have made it possible to carry renegotiation back to the crude materials, including petroleum, entering into goods bought by the Government.

Decision to drop the subject, for the present at least, was reached by the House ways and means committee after representatives of the oil industry and producers of other natural resources protested that the proposed new policy would place producers in jeopardy and would be difficult and expensive of administration. They warned its adoption would make producers highly reluctant to sell to government contractors so long as they could find a market for their output where sales would be final. *(The Oil and Gas Journal, August 17, page 56.)*

Enough members of the committee apparently agreed that the proposed method of carrying renegotiation back to the primary producer would be unwise to make it necessary to give the measure further study before sending it to the floor.

Should Congress return to Washington in November it is possible that the renegotiation bill will receive further consideration, but barring that, it is believed the measure is dead and that an effort to write more satisfactory legislation will be undertaken next year.

One of several shelved.—The renegotiation bill is one of several shelved as Congress sought to adjourn the session next week. Another measure sidetracked was the O'Mahoney resolution for interim operation of the tidelands by the Interior Department. Because of the fight over who shall operate the lands, there was little chance of quick enactment of the legislation. House Speaker Sam Rayburn said the House would consider anything sent over by the Senate, but Rep. Ed Gossett of Texas made it clear he would make a stiff fight to have administration left in the hands of the state.

With little or no chance of action on the matter now, Gossett declared he would press a state-ownership bill as soon as the new Congress convenes next year and expressed confidence it could be passed over a presidential veto.

O'Mahoney's interior affairs committee held hearings on the resolution last month at which oil spokesmen testified the industry will be reluctant to continue to spend large sums in offshore development so long as uncertainty prevails over the validity of the leases secured from the states.

Oil-Supply Study Sought

WASHINGTON.—Fearful of a recurrence of the oil shortage which prevailed during the severe winter of 1947-48, Sen. William Benton of Connecticut sought last week to have an immediate investigation made by the Senate small-business committee into the present and prospective adequacy of supplies, with a view of submitting a report not later than December 15.

Benton's proposal apparently reflected suggestions he received during three meetings he recently held with New England small-business groups, at which he was impressed with the necessity of maintaining the fuel supply of the area if it is to fulfill its responsibilities in military production.

The senator attributed the 1947-48 shortage to lack of pipe for oil production and a shortage of cars and tankers, and said that immediate construction of a natural-gas pipe line to New England would make a future shortage less acute. The proposed investigation, he indicated, would go into that matter, as well as into the steel, tanker, and car situation generally.

Moved to Houston

Kornfeld, Journal writer, to work with McCaslin

JOSEPH A. KORNFELD, former reservoir engineer for Sohio Petroleum Co. who joined the editorial staff of The Oil and Gas Journal August 1, has been assigned to the Houston office as a district editor, and will work with Leigh S. McCaslin, Jr., who has been in charge of that office for the past 2 years.

A native of Marietta, Ohio, Kornfeld moved to Tulsa in 1916. He received his education at the University of Oklahoma, University of Wichita, and Texas Christian University. He holds a master's degree from TCU.

With a background of 10 years in the journalism field, Kornfeld served as oil editor for the Houston Post and Wichita Beacon before joining The Texas Co. as an engineer. He later went with Sohio, with headquarters in Oklahoma City.

Kornfeld is author of a number of papers on various phases of the petroleum industry, and wrote a book entitled "Natural Gas Economics." An article on the Ringwood field of Oklahoma, which

JOSEPH A. KORNFELD

appears on page 84 of this issue, was written by him while in Tulsa preparatory to being assigned to the Houston editorial office.

He is a member of American Petroleum Institute, American Institute of Mining and Metallurgical Engineers, American Chemical Society, and a fellow in the Texas Academy of Science.

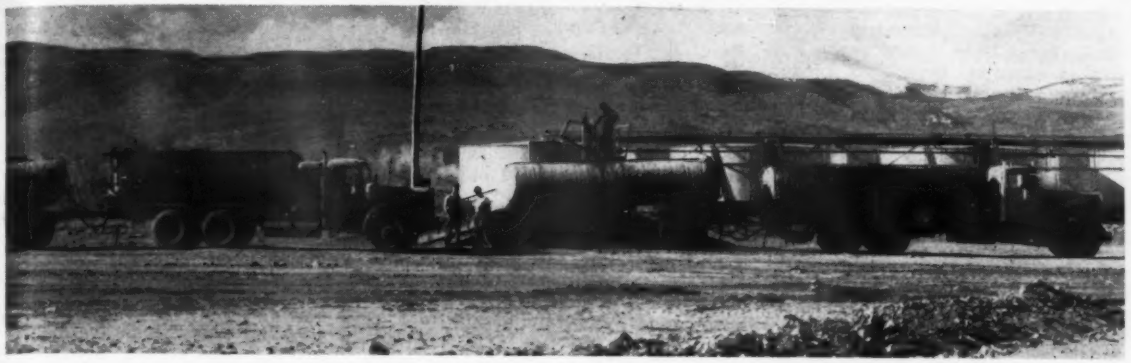
SOUTHWEST

Gas Injection

Low-pressure sweep due for Watkins lime field

PAMPA, Tex.—Gas-injection operations will commence September 15 in Watkins field, Hutchinson County, on the north rim of Texas Panhandle field, according to Fred Neslage, Pampa, pool engineer for the Watkins Operators' Committee Gas Injection Project. The area lies in the southeastern corner of the county and extends 12 miles northwest to the Canadian River.

The project, a low-pressure sweep in a stripper field, is the culmination of more than 6 years of intensive engineering study conducted by representatives of Phillips Petroleum Co.,



HOT OIL.—These special insulated transport trucks are carrying low-gravity crude from Carter Oil Co. 1 Ute Tribal, near Roosevelt, Utah, to Salt Lake City, where it is received by Utah Oil & Refining Co. The 32.6°-gravity production solidifies below 90° F., and has to be heated for the 187-mile trip. Tanks are fitted with steam coils, which keep the oil hot enough to remain fluid. This operation is necessary in summer, as well as winter.

Stanolind Oil & Gas Co., The Texas Co., and Kewanee Oil & Gas Co. In addition, about 25 independent operators are represented in this voluntary cooperative operation.

Neslage, who is pool engineer for the West Pampa Repressuring Association, will utilize engineering experience gained in that field towards the design and operation of the new Watkins gas-injection project. Watkins produces from the Permian brown dolomite and exhibits reservoir characteristics similar to West Pampa.

One of the largest oil fields in the Panhandle, Watkins area contains 18,571 productive acres. Of this total, the area that will be repressured will comprise 12,500 acres on which are situated 1,059 wells on 86 producing leases.

MID-CONTINENT

Pool Comeback

Good production found in old Skellyville field

Philip C. Ingalls

SKELLYVILLE field, in the northwest portion of 15n-6e, Lincoln County, Oklahoma, is nearing full development for the second time.

The new pool in this old field is but one of several profitable little pools that Mid-Continent Petroleum Corp. has opened and developed in Oklahoma's old producing area in recent years.

Skellyville was discovered in 1925. It had produced over 1,500,000 bbl. of oil from the Misner-Hunton at about 4,200 ft. by the end of 1945, which saw daily average production at only 40 bbl. of oil and 1,000 bbl. of water.

The field was about to join Oklahoma's list of abandoned oil fields when a farmer-landowner, who had noticed evidence of oil-bearing sand at about 3,000 ft. during the drilling of the original wells in the area, offerred Mid-Continent, the only operator in the field, three quarter sections for one 3,100-ft. test. Mid-Continent checked its old records and found some evidence that the farmer might be right. A radioactivity log run in an abandoned hole indicated that the Prue sand might be productive at about 3,000 ft. The hole was plugged back, the casing perforated with 200 bullets, and the well came in making 50 bbl. of oil per day.

Twenty-two producers. — Skellyville now has 22 wells producing from the Prue; 17 are new holes and 5 are old holes plugged back and perforated. Most of the old wells had been plugged and abandoned, necessitating new holes. One of the old holes is used as a saft-water-disposal well. The wells have been drilled on 20-acre spacing, and there is one well drilling and possibly four more locations.

The Prue is currently producing about 300 bbl. of 42°-gravity oil daily and has accumulated about 225,000 bbl. since it was opened in 1945.

The Prue sand in the area is light gray, fine grained with partings of sandy black shale up to 50 per cent. The sand is 40 ft. thick with an estimated effective thickness of 20 ft. It is easy to understand why this tight sand was passed up in 1925 when the contracted depth was 3,500 ft.

Rotaries used. — The new holes at Skellyville are drilled with rotary tools. Casing is set just above the top of the Prue with packer on tubing. The sand is shot with 300 qt. and comes in flowing between 10 and 120 bbl. daily, averaging about 50 bbl. The shale partings in the Prue are sandy enough so that the hole is not muddied on shooting and wells come in with sufficient pressure to clean themselves.

The only trouble that has been experienced in the pool has been with paraffin which has to be cleaned out of the tubing about every 30 days. Inexplicably, some of the wells are flowing without enough free gas to measure by standard means.

Most of the wells in the pool are still flowing and the possibility of maintaining reservoir pressure by water injection is now being studied.

WEST COAST

Oil in Oregon

Wildcat may give state its first production

Polly DeArmond

THE first commercial production of crude oil in Oregon appeared likely this week, as Tri-State Gas & Petroleum, Ltd., reported encouraging shows in its test in the south central portion of the state.

The company's 1 Fisher, cable-tool operation located in Section 22-40s-19e, is about 10 miles above the California line, and 9½ miles southwest of the town of Lakeview in Lake County.

Last week the hole was bottomed at 1,211 ft., where drilling was temporarily suspended due to a large influx of artesian water. It was reported that Halliburton Oil Well Cementing Co. was to cement off the water so a production test could be run.

Tri-State officials believe the well will make a commercial producer, but declined to release any data on the extent of the shows. The firm, with R. W. Stark serving as chairman of the board, consists of a group of Eugene, Ore., men and holds substantial acreage around the test.

Work increasing. — There have been few favorable indications of production anywhere in the northwestern

XUM

Pacific Coast, but interest was revived in oil and gas possibilities of Oregon and Washington during World War II. Since 1944, seismograph and other prospecting work has picked up. Standard Oil Co. of California, The Texas Co., Union Oil Co., and others engaged in geophysical activity in the Willamette Valley, and Shell Oil Co. and Amerada Petroleum Corp. had exploration crews in the same area. A number of years ago, Richfield Oil Corp. opened offices in Portland. Several thousand acres are under lease.

The first Oregon well was drilled in 1945 by The Texas Co. Its 1 Benson Clatskanie was dry at a total depth of 5,924 ft. The well was located in the northeast corner of Section 36-7n-4w, between Ranier and Mist in Columbia County.

In 1946, the same company established the state's depth record (which still stands) at the 1 Cooper Mountain, 25-1s-2w, Washington County. This dry venture went to 9,263 ft. in volcanics, and tested several zones, recovering only salt water. The well was approximately 12 miles southwest of Portland. The same year, Richfield's 1 Clayton L. Barber was completed dry at 7,885 ft. after being delayed by a fishing job for stuck drill pipe at 6,522 ft. This latter wildcat was staked in 23-1n-1w, 5 miles from Portland in Multnomah County.

Crude Output Up

California's production now near top potential

LOS ANGELES.—California's daily crude production, after dropping to a low of about 855,000 bbl. last May, has climbed back above the 900,000-bbl. mark. Current production is about 902,300 bbl. per day, or about level with that of a year ago.

A portion of this increased output is due to new wells being placed in production, with Wilmington and South Cuyama being the two fields which have contributed most. Bulk of the increase, however, is due to the restoring to production of a great number of wells which produce low-gravity crudes.

At the first of this year it was estimated that some 3,200 of these wells, with a potential output over 100,000 bbl. daily, were closed in because of the weak heavy-crude market. Current estimates place the volume of such shut-in production at less than 40,000 bbl. Most of this potential production is said to be of such extremely low gravity, or have such a high mineral content, that it is uneconomical to refine it. In other words, practically all the state's heavy-crude supply is now being absorbed either as refinery charging stocks or as heavy fuel oil.

It is worthy of note also that despite the substantial rise in production of crudes below 20° gravity, and with crude runs to stills in recent weeks averaging about 40,000 bbl. daily more than in July, California stocks of heavy fuel oil continue to decline. At the first of this month preliminary A.P.I. figures placed stocks of these oils at 14,735,000 bbl., as compared with 16,496,000 bbl. on August 5 and 39,293,000 bbl. on September 3, 1949.

The continued decline in stocks is partially explained by shipments from Los Angeles to the Atlantic Coast. Current shipments are about 45,000 bbl. daily whereas a year ago they were more or less negligible.

GULF COAST

Offshore Oil

Louisiana area may yield 6,000,000 bbl. next year

NEW ORLEANS.—Crude-oil production from Louisiana's offshore oil fields, now the object of the bitter tidelands fight between state and federal governments, will amount to about 6,000,000 bbl. per year if maintained at the rate set for September by the state Department of Conservation.

This quantity, however, is only about 3 per cent of the total output of Louisiana. The September-October allowables for the state total 607,297 bbl. per day, an increase of 2,856 bbl. daily over the August figure. For the offshore fields the current rate of production is 16,499 bbl. per day.

LOUISIANA ALLOWABLES FOR OFFSHORE AREAS—SEPTEMBER-OCTOBER

Operator and area—	Allowable bbl. per day
California Co., Bay Marchand	6,795
California Co. and Shell Oil Co., Main Pass	4,682
Humble Oil & Refining Co., Grand Isle	1,175
Shell Oil Co., South Pass	976
Stanolind Oil & Gas Co., West Cameron	566
Sunray Oil Corp., Breton Sound	461
Kerr-McGee Oil Industries, Inc., Ship Shoal	404
Pure Oil Co., Eugene Island	400
Pure Oil Co., Creole	385
Magnolia Petroleum Co., Eugene Island	300
Humble Oil & Refining Co., South Timbalier	230
Kerr-McGee Oil Industries, Inc., West Cameron	95
Humble Oil & Refining Co., Grand Island	30
Total	16,499

At present prices this offshore oil would have a market value of about $16,000,000 a year. At the usual one-eighth royalty the landowner would receive about $2,000,000 per year, and this is what the federal Government is fighting to obtain.

More than one-third of the offshore oil, 6,795 bbl. per day, will come from one field, Bay Marchand in La Fourche Parish, operated by the California Co. Main Pass field in Plaquemines Parish has an allowable of 4,682 bbl. daily, and Grand Isle field in Jefferson Parish is allowed 1,175 bbl. daily. The remainder of the offshore allowables is distributed among

BIG GOUGER.—This suction dredge, said to be the largest of its kind in the world, is being used by Texas Gas Transmission Corp. in making a 20-ft. ditch on the bottom of the Mississippi River near Greenville, Miss., for its new underwater pipeline crossing where two 20-in. lines will replace old 10, 12, and 16-in. lines. The cutter, shown partly above the water, is at the end of a suction pipe which can handle 50,000 cu. yd. of mud daily and discharge it away from the navigation channel while the vessel is maneuvered by the anchors hanging from the booms.

10 other fields with daily allowables ranging from 30 to 976 bbl.

Bay Marchand, located 2½ miles offshore from Bayou La Fourche, has produced more than a million barrels of crude oil since its discovery March 3, 1949. Its current allowable of more than 200,000 bbl. a month ranks it with many of the big onshore fields along the Gulf Coast.

The accompanying table shows the September-October allowables for offshore fields set by the Louisiana Department of Conservation.

INDUSTRY AFFAIRS

New Uses for L.P.G.

Producers take stock of potential markets as their fuel finds uses as diverse as airplanes and cigaret lighters

Kenneth B. Barnes

NEW markets for liquefied petroleum gas are developing so rapidly that the manufacturers themselves are having difficulty keeping up with the trend.

The new market with the biggest potential is the use of propane and butane as fuel for internal-combustion engines, particularly for tractors, trucks, and buses. However, an airplane fueled with propane is now making experimental flights with great success, and the fuel is being used in such diverse other ways as pocket cigaret lighters and household garbage incinerators.

The Natural Gasoline Association of America, whose members produce L.P.G., is now conducting a survey of the growth and potential of these new uses, and expects to have results ready for announcement next spring. The study will also include estimates of the volume of L.P.G. which could be produced if required by large new markets.

Tractors.—While no firm figures are available, it has been estimated unofficially that 100,000 farm tractors are being converted to burn L.P.G. this summer. Some tractor manufacturers supply L.P.G. equipment at the factory on request, but the bulk of the changeovers comes through conversion kits manufactured by independent companies in various parts of the country. Many of these manufacturers report that they are unable to keep up with their orders.

New conversion kits are coming on the market constantly. One of the latest, to cite a single example, is that produced by Baker Flash-O-Trac Co., Inc., Plainview, Tex., which circulates hot water from the tractor's radiator through a heat exchanger in the fuel tank. This vaporizes the propane, which is then drawn into the carburetor. The only change made in the carburetor is replacement of the venturi with one of larger size and different shape, and the tractor can be run on either gasoline or L.P.G. by operating a valve.

This manufacturer has just expanded its plant to produce 100 conversion units per week. Its sales argument is economical operation, and it states that 2,000 gal. of L.P.G. costing $140 will do the same work as 2,000 gal. of gasoline costing $300.

Buses.—The most spectacular new use for propane is the fueling of intracity buses *(see "Propane Potential," The Oil and Gas Journal, August 10, page 41.)* Several cities are experimenting with a limited number of propane-powered buses, but a milestone in the trend was the recent action of the Chicago Transit Authority in ordering 500 of these buses, estimated to consume about 6,000,000 gal. of propane a year.

The chief manufacturer of propane-powered buses, Twin Coach Co., Kent, Ohio, now is attempting to interest other cities by means of a demonstrator bus it has recently put on the road. Because facilities are lacking for refueling the bus in some cities and on long trips between cities, this demonstrator carries its own supply of L.P.G. in a specially designed trailer, having 500-gal. tanks designed for 250 psi. working pressure and filling equipment operated by electric motors.

Private cars.—In the areas of the Southwest there are sufficient numbers of retail dealers handling L.P.G. to permit operators of fleets and private cars to use propane and butane as fuel in place of gasoline. In Oklahoma, for example, five inspectors in the office of the State Fire Marshal are now using L.P.G. in their private automobiles which they drive throughout the state on a travel allowance of 6 cents per mile. They pay about 16 or 17 cents per gallon for their fuel as against 23 to 28 cents per gallon for gasoline, and are enthusiastic over the resulting economy.

The head of the L.P.G. department in this office, Earl Kennicutt, recently had his personal 1949 Cadillac equipped with a combination carburetor and a 22-gal. L.P.G. tank in the rear trunk space. A control on the dash permits him to switch from gasoline to propane or butane.

Airplanes.—The use of L.P.G. in airplanes is another potential market, but to date only one plane in the country has been licensed to use it on an experimental basis. This is a four-place Aeronca owned by L. L. Hughes, president of Hughes Carburetor Co., Oklahoma City, manufacturer of L.P.G. conversion units for tractors.

The firm has developed a high-pressure L.P.G. storage tank and vaporizer system which operates in conjunction with the plane's regular carburetor system. Hughes recently flew the plane on propane on round trips between Oklahoma City and Chicago and Calgary, Alta., and reports that the fuel gave good economy, satisfactory octane performance, and absence of carbon and sludge formation.

Lighters.—Among the sidelights of

Demonstration unit used by Twin Coach Co. to interest city transit systems in its new propane-powered bus. Because some cities still lack facilities for ready refueling the demonstrator carries a supply of propane in its trailer.

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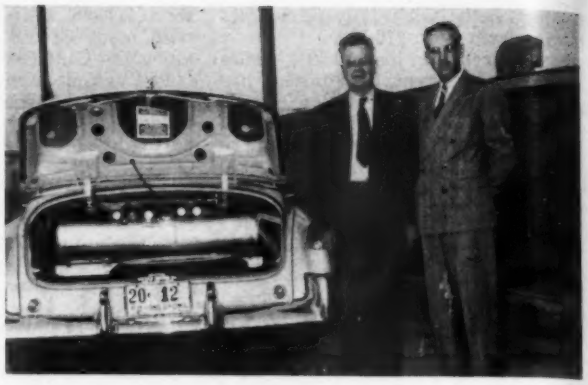

Propane conversion unit for farm tractors manufactured by Baker Flash-O-Trac Co., Inc., one of many such units on the market. In the other picture Earl Kennicutt, head of the L.P.G. department of the Oklahoma Fire Marshal's office, shows his butane-propane car to H. D. Robinson, Santa Fe Engineering & Equipment Co., Maywood, Calif., who designed the installation.

the swing to L.P.G. are some uses which are interesting through holding infinitesimal market potentials. Wickless cigaret lighters, fueled by disposable cartridges of butane or propane, are now being marketed by several firms. One firm, which brought out a desk model only 4 months ago, has already sold a million dollars' worth and is now introducing a pocket model.

Still another potential market lies in a household garbage incinerator just coming on the market which uses butane or propane to provide a hot, odorless fuel to destroy household wastes.

Such miscellaneous uses popularize L.P.G., demonstrate its economy and safety, and interest the general public in the possibilities of wider uses for this fuel.

"Blow Your Horn"

Oil men everywhere are preparing to tell people about their industry during Oil Progress Week October 15-21

NEW YORK.—Oil men throughout the country are completing their plans to participate in Oil Progress Week October 15 through 21, the second nationwide observance of this event.

Plans to add a final impetus to the program were perfected by the Oil Industry Information Committee in Atlantic City this week, but many companies and community committees already have their programs well outlined.

In general pattern, Oil Progress Week will be similar to last year, but many more oil men are expected to take part and it is planned to give the public an even more definite understanding of how "Petroleum Promotes Progress."

Local option.—Each oil company and each local committee is developing its own program, and these vary widely. The usual plan includes decorated filling stations, open houses at refineries and other oil-industry facilities, window displays, newspaper advertising, free movies, luncheon speeches, and radio programs. But some communities will stage parades, barbecues, pageants, and elaborate celebrations of many sorts.

To assist the local groups, the O.I.I.C. headquarters has sent out more than 8,000 kits of suggested material to help tell the story of petroleum progress. These kits include a variety of materials such as typical speeches before luncheon and civic clubs, sample radio scripts, material for preparation of newspaper editorials and feature stories, and suggestions for window displays.

Because of the community-level participation, it is estimated that as many as 2,000,000 oil men and women will take some part in the program of telling oil's story to the public. In some cities, notably Atlanta and Oklahoma City, women employes of oil firms are taking over a large portion of the program.

Looking ahead.—Since 1950 is the mid year of the century, the central theme is the promise of better living in the future brought by the petroleum industry, and many of the slogans are concerned with this theme. Petrochemicals and the thousands of items now being manufactured from petroleum fractions will be dramatized, and many retail store windows will have displays of articles of merchandise made in part from petroleum products.

A number of bulletins and leaflets have been prepared by the national committee to assist oil-company employes to take part in their local programs during Oil Progress Week. One of these is called "Blow Your Horn," and suggests how filling-station operators can take advantage of the week to tell their customers about their industry.

Another shows how petroleum has contributed to employment and easier living in many occupations, and others give brief facts about the industry and refute popular misconceptions. These are to be used by oil men in answering questions from their customers and the general public.

Imports Campaign Silenced

NEW YORK.—The Korean war and the resulting recognition of the need for all possible sources of oil supply has for the time being silenced the campaign against oil imports, George V. Holton, chairman of the board of Socony-Vacuum Oil Co., Inc., told company stockholders last week.

Holton pointed out that the company in the past had contended, often against strong opposition that "to a nation holding only a third of the world's proved oil reserves and using about two-thirds of the world's oil output, concessions abroad are a vital national asset."

Furthermore, the current international crisis is showing the "unfairness and unsoundness" of the attacks which have been made on reputable companies primarily because of their size. In various instances, the Government has turned to these same companies for assistance in the defense program, said the Socony-Vacuum chairman.

"In a very practical sense integration of our company is another example of looking ahead in preparedness," Holton added. Socony-Vacuum and affiliates are now producing 199,000 bbl. daily net in the United States, some 30,000 bbl. daily more than the 1949 production. If proration restrictions were lifted the company could add substantially to this present output, he said.

Imports Drop

July total down 8.8 per cent over June average

IMPORTS of crude and petroleum products into the continental United States averaged 742,000 bbl. daily for the month of July. This represents a decrease of 72,000 bbl. daily or 8.8 per cent from the June average but is 133,000 bbl. daily or 21.8 per cent greater than imports for July 1949.

Crude imports were off 51,000 bbl. daily from June and were only 10,000 bbl. daily more than the average for July of last year. The major part of the decrease was in receipts from Venezuela and Colombia. Crude from Mexico gained 535,000 bbl. for the month from the low level in June. On a daily average basis, receipts from Middle East changed little from June with the gain for Saudi Arabia balanced by a decrease for Kuwait. Crude classified as "other" in July came from Trinidad.

Gulf Coast refineries received 359,000 bbl. of foreign crude during the month. All other imported crude came to the East Coast.

Resid imports off.—Imports of residual fuel averaged 269,000 bbl. daily in July compared with 289,000 bbl. daily in June and 184,000 bbl. daily in July 1949.

Exports for the month, excluding shipments to territories, were about 1,000 bbl. daily less than in June but about 25,000 bbl. daily greater than in July of last year. Residual exports decreased but shipments of lube oils and other products gained.

IMPORTS INTO CONTINENTAL UNITED STATES
(Thousands of barrels)

	July 1950	June 1950	July 1949
Crude—			
Mexico	757	222	626
Colombia	998	1,314	986
Venezuela	7,803	9,365	8,882
Kuwait	2,236	2,322	1,450
Saudi Arabia	1,214	985	849
Other	110	....	4
Total crude	13,118	14,208	12,797
Daily average	423	474	413
Products—			
Residual fuel	8,325	8,659	5,705
Other products	1,575	1,544	373
Total products	9,900	10,203	6,078
Daily average	319	340	196
Total all oils	23,018	24,411	18,875
Daily average	742	814	609

EXPORTS*
(Thousands of barrels)

	July 1950	June 1950	July 1949
Crude	3,250	3,226	2,866
Gasoline	1,442	1,422	1,901
Distillate	905	608	442
Residual	935	1,398	729
Lube oils	1,076	916	998
Other products	692	501	583
Total all oils	8,300	8,071	7,519
Daily average	268	269	243

*Excludes shipments to territories.

MEETINGS

I.P.A.A. Plans Completed

ST. LOUIS.—Plans have been completed for the twenty-first annual convention of Independent Petroleum Association of America, which will be held at the Jefferson Hotel October 2-3. Among topics to be discussed are the industry's ability to meet national demands in the future, steel allocations, and the effect petroleum has on the lives, comfort, and security of all Americans.

J. E. Warren, I.P.A.A. president, will be one of the speakers at a public-interest petroleum-industry forum October 3. He will present views of authoritative leaders of the industry and Government on relation of the oil and gas industries to increasing military preparedness.

In addition, a full discussion of the pressing problems of equitable distribution of steel to the independent oil industry will be held. A "report-to-the-nation" forum will include spokesmen for the industry, men from oil-producing states, and leaders of the federal Government.

More than 250 oil men from 20 states will attend advance meetings of 13 standing committees which will report at the annual meeting. These will be held in Tulsa, Fort Worth, and St. Louis.

A.S.M.E. Plans Advance

NEW ORLEANS.—Plans are advancing for the fifth annual conference of the Petroleum Division, American Society of Mechanical Engineers, which will be held at the Roosevelt Hotel here September 24-28.

Highlighting the gathering will be symposia on producing operations, transportation problems, and refining activities. Climax will be an all-day field trip on September 28, sponsored by Freeport Sulphur Co.

The symposia will include the following papers:

Production.—"Design of High Strength Casing Strings," B. E. Curran, chief engineer, Kerotest Manufacturing Co., Pittsburgh; "Allowable Loads on an Unsupported Casing Column," J. A. Reed, II, associate petroleum engineer, and H. H. Meredith, Jr., supervising petroleum engineer, Humble Oil & Refining Co., Houston; "Engineering Aspects of Oceanography as Related to Offshore Operations," Prof. Dale F. Leipper, acting head, Department of Oceanography, A. & M. College, College Station, Tex.; "Protection of Structures Exposed to Sea Water," B. B. Morton, corrosion engineer, International Nickel Co., New York; "Well Performance in Relation to Gas Transmission Line Requirements," E. R. Phillips, production engineer, Transcontinental Gas Pipe Line Corp., Houston; and "Fatigue Testing and Development of Drill Pipe-to-Tool-Joint Connections," W. S. Bachman, engineer, Hughes Tool Co., Houston.

Refining.—"Corrosion in Amine Plants," C. L. Blohm, assistant manager, and F. C. Riesenfeld, chemist, Flour Corp., Ltd., Los Angeles; "Corrosion of Alloys at High Temperatures With Especial Reference to Attack by V_2O_5," R. A. Kozlik and E. M. Skinner, International Nickel Co., New York; "Effect of Time on Physical Properties of Tanks," T. L. White, chief engineer, Commercial Shearing & Stamping Co., Youngstown, Ohio; "Lubrication of Refinery Equipment," F. M. Leverett, chief power engineer, The Texas Co., Port Arthur, Tex.; "Welding Quality Control in a Petroleum Refinery," A. F. Blumer, head, special-inspection section, Esso Standard Oil Co., Baton Rouge; and "Gas Synthetic Demonstration Plant Design and Construction," Dr. R. G. Dressler, chief, and J. R. Bircher, chemical engineer, Bureau of Mines synthesis plant, Louisiana, Mo.

Transportation.—"Pipe Line Engine and Compressor Lubrication and Maintenance," O. H. Moore, compressor superintendent, Tennessee Gas Transmission Co., Houston; "Design and Development of Mechanical Seals," L. L. Dawson, field engineer, Ingersoll-Rand Co., New York; "Discussion of Pipe Line Sampling," F. H. Warren, Ohio Oil Co., and L. S. Wrightsman, Humble Oil & Refining Co.; "Operation of Submarine Pipe Line and Production Facilities in the Gulf of Mexico," G. W. Osborne, the California Co., New Orleans.

NEXT WEEK

Annual Pipe-Line Number

The September 21 issue of The Oil and Gas Journal will contain all the usual features which readers are accustomed to find in the annual pipe-line number plus these special presentations:

Maps.—Two four-color wall maps folded into the issue, one showing the crude-oil and petroleum-products pipe lines of the United States, the other giving the natural-gas-transmission lines. Both maps are up to date and show the recent growth of the industry.

Census.—A census of the pipe-line industry conducted by the Journal, showing such data as location of pipe-line contractors, manpower in the industry, spreads operating.

Progress.—Review of technological developments in pipe lining during the past quarter century, showing how the industry has progressed from screw-coupled lines to automatic controls.

Pictorial.—The 11 important steps in building a modern pipe line are described in simple terms and illustrated with special drawings.

Special reports.—A series of articles especially written for the Journal by leading authorities in the industry covering such engineering and operating subjects as welding, river crossings, station design, communication systems, and remote gaging.

Pricing Protest

Caltex refuses to deliver Persian Gulf oil products to Europe under lower price schedule set in ECA directive

Dahl M. Duff

THE action of the Economic Cooperation Administration ordering a reduction in the price of petroleum products from the Middle East delivered in Europe under purchases which it finances has stirred up a storm of protest from companies participating in the program. *(See The Oil and Gas Journal, September 7, page 42.)*

Rather than submit to the order, California-Texas Oil Co., Ltd., has refused to make shipments financed by ECA. Its announcement last week was the first open reaction to the directive requiring a flat reduction of the $3.50 per ton in the price of petroleum products at Persian Gulf refineries. Crude shipments are not affected by the order.

Caltex' firm stand against the ECA action apparently will mean some loss of business for the company. It operates the 150,000-bbl. refinery at Bahrein, and a small part of the production of this plant moves into Europe and the Mediterranean under ECA financing.

If the other companies with refining interests in the Persian Gulf also refuse ECA business at the reduced prices, the participating countries presumably will be forced to draw on Caribbean sources to make up for the Middle East shipments. For the Eastern Mediterranean, Caribbean oil costs more than did that from the Middle East under the previous pricing system.

What course these other companies would adopt was not known last week. Besides Caltex, companies principally involved in ECA dollar-reimbursed shipments of products out of the Persian Gulf are Standard Oil Co. (N.J.) and Socony-Vacuum Oil Co., Inc.

Many objections. — Eugene Holman, president of Jersey Standard, spent several days in Washington last week for discussions on the matter with Paul G. Hoffman, ECA administrator. Besides the principle involved in the ECA order, Jersey Standard was understood to have raised several objections on practical grounds. These included the fact that the order was made effective September 15, too quick for the necessary adjustments to be made in the industry, and the company was hopeful that the effective date would be set back.

W. H. Pinckard, chairman of the Caltex board, wrote Hoffman that the company "found itself obliged to inform ECA that, after September 15, Caltex will be unable to supply petroleum to the ECA countries at the substantially arbitrary reductions below lowest competitive prices which the new ECA regulation would impose." Since the ECA order applied only to the Middle East, Pinckard said it discriminated against this area and particularly against Caltex which has no sources of supply outside the Eastern Hemisphere.

Unfair disadvantage.—The Caltex announcement said that in his letter to Hoffman, Pinckard expressed surprise that the ECA would issue a regulation "which so clearly discriminated against Caltex in the Middle East and placed upon it an unfair disadvantage compared with competitors obtaining their supplies in other producing areas of the world, particularly at the present time when it is so obvious to all that an American-owned oil company such as Caltex, doing business in the Middle East, has taken serious and unusual risks in its operations."

"Caltex' view," the announcement said, "is that it seems very unfair to have a regulation issued which is designed to force an arbitrary reduction in the price of Caltex petroleum produced in the Middle East to a point below competitive prices when the same regulation does not apply to companies in the United States where the investment is relatively safe. Such government policies can only result in discouraging American industry, enterprise, and investment abroad."

The amount of products actually involved in ECA shipments from Persian Gulf refineries is relatively small. Development of the European refining industry in the last few years has led to increasing Middle East crude-oil shipments, both ECA financed and others. The Persian Gulf refineries dispose of a large part of their output in Southwest Asia and Africa.

Suez Canal figures show the total of products moving into Europe and the Mediterranean out of the Persian Gulf. For the first 5 months of this year, total northbound petroleum shipments were 18,255,000 tons of which 5,100,000 tons were products. This equals about 250,000 bbl. daily against total Persian Gulf refining capacity of about 800,000 bbl. daily. Of the 250,000 bbl. daily, only a comparatively small part is ECA financed.

Broad sales effect. — The objections raised against the ECA order center on its almost certain effect on all sales of products made out of the Persian Gulf area. This in turn would have repercussions on the accepted pricing procedure throughout Europe and the Eastern Hemisphere.

The order is considered unusual in that ECA, in the past, has disavowed any intentions of becoming a price-setting agency. Yet this appears to be exactly the force of its order. Beyond that, the ECA order implies the lack of competitive market conditions in the Persian Gulf, which is considered to be unjustified.

Even some of the most impartial observers of industry affairs feel that the way in which ECA went about the matter was wrong. Their contention is that the agency has exceeded its authority and gone beyond its functions since the prices at which it was previously financing shipments were those prevailing in all normal commercial transactions.

Previously prices for products shipped out of the Persian Gulf were based on Caribbean competition. Freight rates for shipments from the Caribbean and from the Persian Gulf are approximately equal at Malta. To the west of this point, industry practice was to absorb freight charges at individual points to make the laid-down price competitive with the Caribbean. To the east of Malta, the price was f.o.b. Persian Gulf price plus actual freight from the Persian Gulf.

Though based on the accepted method of meeting competition, this system resulted in prices, for example, being more in a locality such as Greece than they were in the United Kingdom. The $3.50 a ton which the ECA ordered is equal to the amount of the absorption at Gibralter. Thus, the directive in effect extends to the entire Mediterranean the absorption previously made at Gibralter. The order also requires certain further reductions for freight absorption in Western Europe in addition to the $3.50-a-ton cut.

ECA, Companies Feuding

WASHINGTON. — The Economic Cooperation Administration and American companies supplying Marshall-plan oil from the Middle East were still feuding this week over the former's new price order, effective September 15, with intimations that ECA might release the correspondence with the companies which preceded issuance of the order.

ECA officials said that so far as Marshall-plan oil was concerned, the

price reduction would effect only a relatively small proportion of total European purchases, going chiefly to Greece and Turkey, but admitted the companies might see in it a possible basis for demands for lower prices on oil sales outside the Marshall plan.

The Marshall-plan companies were informed of the order in a letter explaining that the action was taken "to limit prices eligible for financing to levels which could properly be considered as approximately the lowest competitive price in the supplying market" and "would substantially eliminate the discrimination existing between the lower f.o.b. prices charged on shipments to Northwest Europe, the United Kingdom, and Scandinavia and the prices charged f.o.b. Middle East on shipments to other countries."

ECA officials explained the order would affect Marshall-plan shipments from the Middle East to those Mediterranean countries east of Portugal, which is considered the "watershed" or dividing line on the basis of data submitted heretofore by the companies. This would include Italy, but that country now is close to self-sufficiency in oil products except, perhaps, for a small amount of residual fuel, they said.

LATIN AMERICA

Brazilian Shale

Standard awaits change in political attitude

STANDARD OIL CO. of Brazil does not consider development of shale deposits in Southern Brazil economically feasible and is not interested in participating in their development.

Morris W. Johnson, president of the Standard Oil Co. (N. J.) affiliate, made this statement in Rio de Janeiro last week in denying published reports that the company had made concrete proposals to the government for development of the shale deposits in Parahyba Valley.

Mention of the shale operations came as another episode in the prolonged discussion in Brazil over development of its domestic oil resources. For several years, certain political groups in Brazil have strongly opposed liberalization of laws to open up the country to exploration for oil by private foreign capital.

Standard Oil Co. of Brazil made its position clear in a series of advertisements published in Brazilian newspapers beginning late last year. In them the company pointed to its long history as a supplier of petroleum products in the country and declared its willingness to take part in the development of the country's oil resources when given an opportunity.

Await political change.—A law which would remove some of the legal barriers to exploration by foreign capital in Brazil was introduced several years ago, but no final action taken. It now appears that nothing will be done until after the election of a new president and the inauguration of a new administration next February. There still remains a serious question whether political opposition to foreign oil development in Brazil can be overcome.

Johnson's comments regarding the shale-oil work were of especial interest in view of the fact that the U. S. Bureau of Mines made tests of Brazilian shale last year and declared in a report that the deposits might provide a partial solution to the country's persistent fuel shortages. The bureau tested the shale samples in its Laramie, Wyo., laboratory and found that those from the Tremenbe-Taubata area showed an oil recovery varying from 12.3 to 36.5 gal. per ton for the different kinds of shale *(The Oil and Gas Journal, April 6, 1950, page 140)*.

Brazil Starts Stockpile

Substantial stockpiling of oil and other essential fuels is planned by the Brazilian Government. The war in Korea has confronted the government with the fact that the country's storage of gasoline, fuel oil, and other products is sufficient only for 6 months. Jose Braz, chief of the government's Export-Import Control Department, said additional tankage would be constructed for a capacity of more than a year's supply. The cost of the additional stocks of all commodities, including oil as well as industrial equipment, transportation machinery, and accessories, is estimated at $150,000,000 worth of foreign exchange.

Mexican Loan Unconfirmed

WASHINGTON.—There has been no official confirmation of reports that the Export-Import Bank has granted Mexico a loan of $150,000,000 to develop its oil, industrial, and agricultural potentialities.

Mexico's president, Miguel Aleman, in his annual "state-of-the-nation" speech, September 1, announced that the loan had been granted.

Speculation was raised last week over whether New York Mayor William O'Dwyer, recently nominated by President Truman as ambassador to Mexico, might take the Mexican loan in his pocket when he assumes that post. Truman, when queried about it at a news conference, cast no light on the matter, however.

Deftly dodging the question, the President said it should be addressed to O'Dwyer, who has not yet been confirmed by the Senate, and went on to other matters.

Observers in Washington, however, suggested that O'Dwyer could be started off in his new job on a solid footing by letting him arrange the loan, which has been the subject of much negotiation and even more discussion. They also suggested that it would go far toward improving relations with Mexico, which have suffered recent setbacks, one by the failure of the loan negotiations a year ago, and another by the publicity of the underlying reasons for abro-

***NEW GUINEA TERMINAL.**—The first commercial bulk-petroleum terminal in New Guinea is this just completed at Lae by Vacuum Oil Co., Pty., Ltd. Facilities include six tanks of 14,000-bbl. capacity, drum-filling and service facilities, housing for the staff of 75, and a pipe line from the wharf. Much surplus Army material was used in its construction. The company is now completing a similar terminal at Port Moresby.*

XUM

gation of the reciprocal trade agreement with that country.

The trade agreement was formally denounced by President Truman last week, the last step toward its dissolution at the end of this year.

Pemex Modernizing Plants

The refinery program of Petroleos Mexicanos, which was marked by the recent opening of the new 30,000-bbl. daily plant at Salamanca, will be continued with the modernization of several of the older Pemex plants.

Antonio J. Bermudez, Pemex director, said in Mexico City that work will start soon on improvements at Poza Rica and Mata Redonda in Vera Cruz. Mata Redonda is a 9,000-bbl. unit with a 3,800-bbl. cracking capacity. At Poza Rica, Pemex has a 3,100-bbl. skimming plant.

In addition, Pemex refining capacity in Tamaulipas will be considerably enlarged. Tamaulipas refineries are Arbol Grande, capacity 16,600 bbl. daily, and Cuidad Madero, capacity 47,250 bbl. daily and 6,400 bbl. daily cracking. Pemex also has under construction a 5,000-bbl. capacity refinery at Reynosa in Tamaulipas.

Maracaibo Outlet

Advance work starts on new Venezuela pipe line

COMPLETION of the proposed Shell-Mene Grande-Texas 30-in. pipe line out of the Lake Maracaibo Basin in Venezuela will mean a further substantial reduction in the movement of this crude by shallow-draft tanker.

The new line, which is expected to be built and placed in operation about the middle of 1952, will have an estimated initial capacity of 235,000 bbl. daily. The first line to be built out of the lake basin was completed last year by Creole Petroleum Corp. and is now carrying more than 300,000 bbl. daily.

Construction of these lines make possible a more economical transportation of Lake Maracaibo crude. The saving to Creole from the operation of its line has been estimated at 8 cents a barrel. The small-size Venezuelan tankers which carry the crude to transshipping or refining centers at Las Piedras, Curacao, and Aruba, are relatively expensive as compared to pipe-line operation.

Western Venezuelan production, virtually all of which comes from the lake area, has been averaging more than 1,100,000 bbl. daily. Based on this present output, the new line, together with that of Creole, will provide for the movement of approximately half the total lake production. The Creole line has a total capacity of about 380,000 bbl. daily.

Shell Caribbean Petroleum Corp. is the Shell company interested in the new pipe-line project. Mene Grande Oil Co. has for a number of years operated a deep-water loading terminal at Las Piedras on Paraguana Peninsula where the new line will terminate. Texas Petroleum Co. now has an arrangement with Mene Grande under which its production is handled at the terminal, and will continue to use the terminal after the new line is completed.

Advance work starts.—The new line will carry Shell-produced crude to Cardon on Paraguana Peninsula where the company has a refinery and deep-water shipping terminal which was completed last year. The Shell organization will handle the construction and be the operator of the line.

Preliminary work on the new line is understood to be now going forward, and work plans will not become definite until after the first of the year. The line, for which 30-in. welded pipe is contemplated, will be 150 miles in length. It will move the production of the three companies out of the Mara and Maracaibo districts. At present, this amounts to about 225,000 bbl. daily.

The line is to originate at Shell's Palmarejo terminal which is located a few miles from Maracaibo. Two major underwater crossings will be required. One is about 5 miles across the lake entrance. The other is approximately 15 miles across the Gulf of Coro before reaching Paraguana Peninsula. This latter crossing was a major engineering achievement in the construction of the Creole line.

Survey Now Under Way

A joint seismograph survey in the Lake Maracaibo area of Venezuela which was reported being arranged last week *(The Oil and Gas Journal, September 7, 1950, page 49)*, actually got under way August 15, it is now learned.

The survey is being made for Creole Petroleum Corp., Mene Grande Oil Co., Shell, and Richmond Exploration Co. Work is being done by Marine Geophysical Co., Dallas, and not by Marine Exploration Co., Houston, as was previously reported.

Creole's Output Lower

Production and refinery runs of Creole Petroleum Corp. in Venezuela in July dropped back somewhat from the record high levels reported in June.

During July, Creole had an operated production of 625,116 bbl. daily and a net production, plus purchased royalty oil, of 659,593 bbl. daily. Both were about 46,500 bbl. daily under the averages for June. Of the July operated production, 475,687 bbl. daily came from Lake Maracaibo, 3,680 bbl. daily from Cumarebo, and 145,749 bbl. daily from Eastern Venezuela.

The Caripito refinery in Eastern Venezuela processed an average of 59,984 bbl. daily in June. Runs at the new plant at Amuay averaged 43,668 bbl. daily.

Rigs in operation by the company in July averaged 5.8 against 6 in June. The company completed seven wells. Two of these were exploratory operations, one in Pedernales at 8,817 ft. and the other in Quiriquire at 4,590 ft. Of the five field wells, three were in Maracaibo with average depth of 4,847 ft., and 515 bbl. daily average initial production. The other two were in Quiriquire with 4,208 ft. average depth.

EUROPE

British Refinery

Work begins as Vacuum merges with Cory Bros.

VACUUM OIL CO., LTD., has completed its acquisition of the Thames River property of Cory Brothers & Co., Ltd., in England and work has been commenced on the construction of a new 20,000-bbl. refinery.

A company announcement in London said all the necessary formalities of the Cory Brothers merger into Vacuum have been carried out. Vacuum Oil was a subsidiary of Socony-Vacuum Oil Co., Inc. Under the new arrangement, Powell Duffryn, Ltd., which owned Cory Brothers, and Socony-Vacuum will each hold half interest in Vacuum Oil.

The required permits from British Government agencies for the construction of the new refinery have been obtained. Lummus Co., Ltd., has the principal contract, and preliminary design work has been completed. Contracts for the extension of the railroad at the plant and for civil engineering work have been let.

Target date set.—Target date for completion of the new refinery is January 1953. The announcement said materials for the plant will be obtained in England and that the British Finance Corporation for Industry, Ltd., is assisting with the financing by a loan. The plans for the refinery construction by the two companies were first disclosed last March. Cost of the project is estimated at £10,000,000.

The board of directors of Vacuum has been enlarged by the election of four Powell Duffryn representatives. The full board now consists of J. C. Gridley, H. W. Rocke, J. S. Vesey Brown, W. M. Codrington, Charles Lawrie, Sir Herbert Merrett, J. Blake Middleton, Miles B. Reid, and H. V. Vale. Gridley and Rocke continue as chairman and managing director respectively. Middleton, prior to early last summer, was European refining

"I wasn't asleep," said the Dormouse

EVERY boy and girl knows the drowsy Dormouse of Alice in Wonderland. He was elbowed and pinched by the Mad Hatter and the March Hare as he mumbled in his sleep at the tea party.

But our young people aren't so well versed in everyday economics. They have a sadly distorted picture of the profits of business. They don't realize why profits are necessary, how small they are, or how they are divided.

For instance, in a recent survey of high school seniors, it was discovered that they believe over 50% of the sales dollar is profit and they think stockholders receive 24% of it. Actually business profit averages less than 8%, with less than 3% distributed as dividends. Business uses most of its profit, moderate as it is, for new plant and equipment, to improve products and to make more jobs.

Misconceptions among our youth bode ill for America's future. They open the door for too ready acceptance of dangerous isms and false foreign philosophies. Such misunderstanding of economics can be corrected only with facts supplied by business itself. You as a leader in your community must share this responsibility.

The American business man must not allow himself to be cast in the role of the Dormouse, pinched and pilloried by the March Hares of communism and the Mad Hatters of the "everything for nothing" state.

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coordinator for Socony - Vacuum in New York.

The property which Vacuum has acquired in the deal and which will be the site for the new refinery is about 25 miles below London Bridge on the north bank of the river. Cory Brothers has operated an oil blending, treating, and storage plant there. The new refinery will be a complete processing unit with emphasis on the production of lubricating oils.

Crude for the refinery will come from the Middle East, and its lubricating-oil production will replace imports which now come mainly from dollar - production areas. Last year Britain spent £4,500,000 on lubricating-oil purchases in the United States.

Pioneering Woes

Britain's Catarole plant faces refinancing crisis

A PROMINENT unit in the petrochemical industry which has been developed in Britain since the war has run into serious financial difficulties.

The company is Petrochemicals, Ltd., whose plant at Partington, near Manchester, went into initial operation in February 1949.

In London, Sir Robert Renwick, new chairman of the company, told shareholders some £2,500,000 of new capital will be needed soon and said that when the plant is in full commercial production it may be necessary to write down drastically the share capital.

Most of the money will be required to meet "running in" losses at the Manchester plant and to pay for higher costs of building the installation. Among other things, the chairman also blamed British currency devaluation, which added £4,500,000 to raw-material costs, and lower than expected sales of byproduct gases from the plant. He said he believes the conception of the scheme is "sound and well planned" but indicated even more money will be needed in the future.

Pioneer effort.—The Partington plant is the first to use the Catarole process commercially. It produces liquid products consisting of aromatic hydrocarbons from petroleum charging stock. Initial charging capacity of the plant was 75,000 tons a year.

Petrochemicals, Ltd., holds from Petrocarbon, Ltd., the exclusive license to operate the Catarole process in the United Kingdom. The process was pioneered by Dr. Chaim Weizmann, president of Israel who is also a well-known chemist. Dr. Weizmann is a consultant to Petrocarbon, Ltd.

A large investment in the Petrochemicals, Ltd., undertaking has been made by Britain's Finance Corporation for Industry.

Trieste Plant Expands

"Aquila" adding facilities which will make its oil refinery one of the most modern on the Mediterranean

THE independent organization, "Aquila" Societa per Azioni Tecnico Industriale, is adding facilities to its refinery at Trieste which will make it one of the most complete units on the Mediterranean.

Among equipment being installed is a new reforming and C_3 C_4 splitting plant, propane deasphalting unit, furfural solvent refining unit, M.E.K. dewaxing facilities, contact filtration machinery, and a new fully automatic lube-oil blending plant. From these additional installations, which should be completed by March 1951, the plant will be able to produce a full range of high-quality lubricating oils.

Estimated annual production will be about 30,000 tons (225,000 bbl.) of 95 V.I. lubricating oils and bright stocks, and 8,000,000 lb. of various types of paraffin waxes.

The plant is designed to operate on Middle East crude oil. If operating on some other crude oil, such as Mid-Continent, it would have substantially larger production. The annual throughput of "Aquila" is about 4,000,000 bbl. (11,100 bbl. daily).

Formed in 1935.—The "Aquila" company was established under Italian law in 1935 and the refinery started operations in 1937 with an annual throughput at that time of about 2,700,000 bbl. Products included gasoline, solvent naphtha, white spirit, kerosine, gas oil, fuel oil, high-grade lubricating oils, asphalt, paraffin wax and — in a subsidiary factory — wax candles, boot polish, and similar products. It was the first refinery in Europe to produce high-grade lubricating oils by solvent extraction and solvent dewaxing, using SO_2 and SO_2-benzol as solvents.

In June 1944 the refinery was almost completely destroyed by an Allied air attack. Operations were resumed in June 1947 in the reconstructed atmospheric and vacuum-distillation plants, chemical-treatment plants, and auxiliary installations. Of interest is the fact that reconstruction was achieved in 10 months.

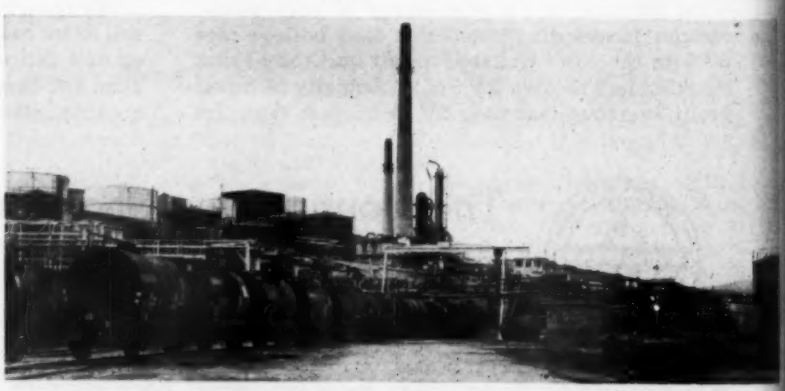
The refinery is now working at more than 140 per cent of prewar capacity, with the following average output:

	Bbl. annually
Gasoline and white spirit	725,000
Kerosine and power kerosine	275,000
Gas oil	1,000,000
Fuel oil and road asphalt	2,000,000
Total	4,000,000

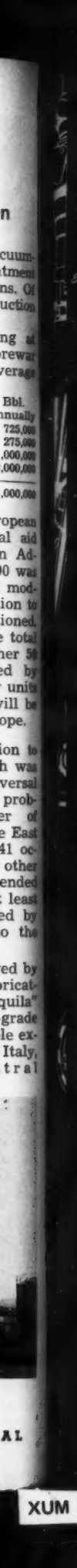
"Aquila" was the first European oil refinery to receive financial aid from the Economic Cooperation Administration. A total of $4,250,000 was provided for reconstruction and modernization, with special application to the new plants already mentioned. This is about 50 per cent of the total cost of new investment, the other 50 per cent having been supplied by "Aquila" itself. When these new units are in operation, the refinery will be one of the most modern in Europe.

Low octanes noted.—The decision to erect the reforming plant, which was designed and engineered by Universal Oil Products Co., arose from the problem that the octane number of straightrun gasoline from Middle East crudes is rather low (about 40-41 octane number, unleaded). On the other hand, the market requirements tended towards an octane number of at least 72, which could not be obtained by adding tetraethyl lead alone to the gasoline at present produced.

A second problem will be solved by the completion of the new lubricating-oil units. Before the war, "Aquila" specialized in producing high-grade lubricants and gained considerable experience in this field. Nowadays Italy, the Mediterranean, and Central



Rail tank-car loading racks at the "Aquila" refinery at Trieste.



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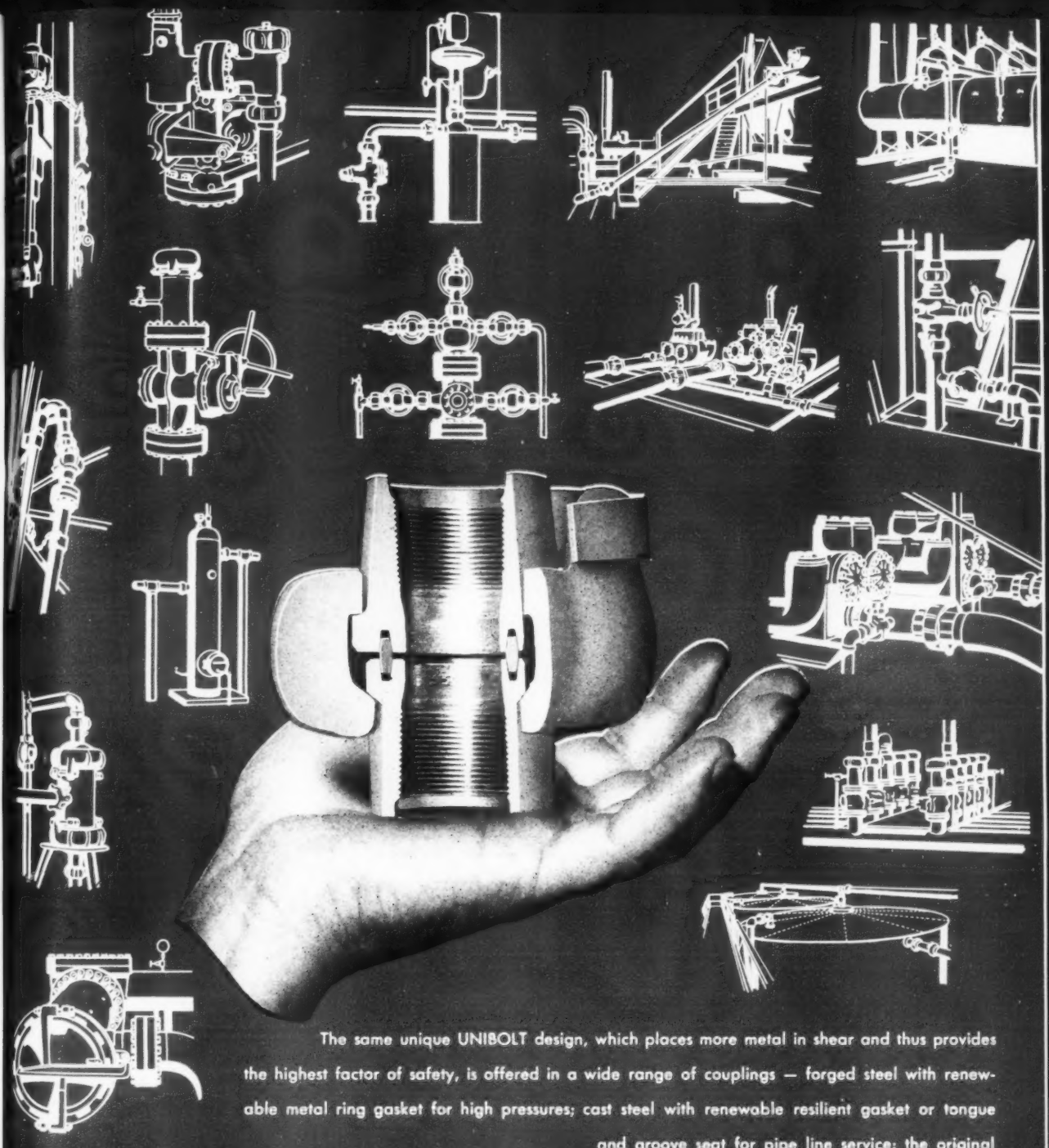

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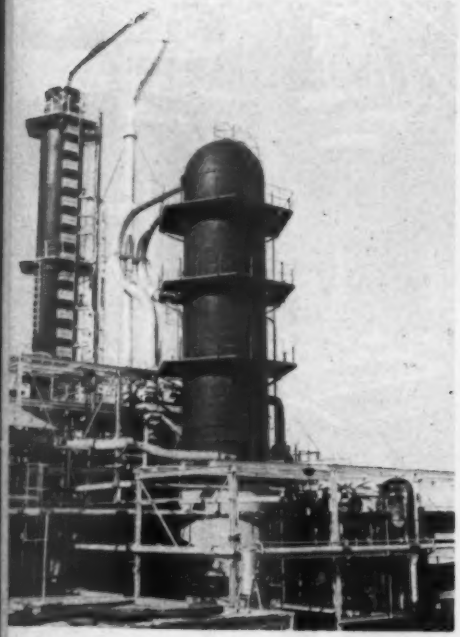

A distillation unit at the "Aquila" refinery at Trieste.

European countries import these oils to fulfill their main requirements. The projected new production from "Aquila" will, therefore, not only save Italy substantial amounts of foreign currency, but will also save foreign currency on freights and drums for transport. The lubricating-oil plant is licensed by The Texas Co. and Standard Oil Development Co. and was engineered by E. B. Badger & Sons Co.

The "Aquila" organization has an associated company, S.A.P.A.A. (Societa per Azioni Petroli Alto Adriatico, Milan), which provides distribution facilities throughout Italy, including many coastal and intermediate depots and numerous service stations. Its supermodern filling station recently opened in Milan, was erected on a site of about 33,000 sq. ft. owned by S.A.P.A.A. and covers an area of approximately 12,000 sq. ft., of which 900 sq. ft. are for the station and 1,800 sq. ft. for the approach, including among other things a waiting room and tourist department, bar, living rooms for caretaker, vehicle-washing and greasing plant, telephone exchange, and telegraph service.

General manager of "Aquila" is Diego Guicciardi. The technical manager, who is in charge of the construction program and refinery operation, is Dr. T. L. de Pastrovich. Manager of S.A.P.A.A. is Domenico Albonetti.

Only 2 years after almost total destruction, the one millionth ton of crude was discharged at "Aquila" on Easter Monday, 1949.

MIDDLE EAST

Haifa Resumption

Refinery meets home demand; source vague

THE Haifa refinery of Consolidated Oil Refineries, Ltd., recently resumed operations at about a fifth of its total rated capacity of 83,000 bbl. daily.

The partial reopening of the refinery resulted from the agreement reached 2½ months ago in London between Israeli Government representatives and officials of Anglo-Iranian Oil Co., Ltd. Anglo-Iranian operates the plant and is half owner with Shell *(The Oil and Gas Journal, July 6, page 32)*.

Reports from Haifa indicated the refinery is running about 16,000 bbl. daily. About 40,000 tons of crude were on hand as the plant was reopened, and it was said arrangements have been made for regular arrival of tankers at Haifa.

Source of the crude was not officially disclosed, though it was previously reported it would come from Qatar and would be supplemented by shipments from South America. Except for a short period last year the refinery has been shut down since the spring of 1948. As a result of the Arab-Jewish strife, Iraq refuses to allow movement of its crude through the pipe line to Haifa, and Egypt blocks passage of Haifa-bound tankers through the Suez Canal.

United States companies with marketing interests in Israel assisted in the arrangements for reopening the refinery. The plan provides for processing enough oil only to meet domestic Israeli requirements with none of Haifa's previous substantial export trade.

Although the refinery's operation will make most imports unnecessary, the Israeli Givernment has announced that severe restrictions on uses of motor fuel will become effective October 1.

FAR EAST

Burmah Wildcat Planned

The Burmah Oil Co., Ltd., organization is making preparations to drill a wildcat at Patharia, in the province of East Bengal, Eastern Pakistan.

The company is moving in equipment for the test, and the well is expected to be spudded in early next year. A diesel rig, capable of going to 7,500 ft., will be used.

Two previous tests were drilled in the Patharia Forest area before the war. One produced a small amount of oil but subsequently ran into difficulties and was abandoned. The other well was dry.

Further operations in the area were suspended owing to the imposition of an official moratorium on oil exploration which was prolonged by the war and did not expire until September 1948. Operations planned after that date by the company were held up pending the resolution of the boundary between East Bengal and the Indian Province of Assam.

The new drilling operation in East Bengal will be carried out in accordance with the Pakistan Petroleum Rules. These, issued in September of last year, provide for a 3 to 4-year exploration license, a prospecting license good up to 4 years, and 30-year production leases. Lessee is required to offer 30 per cent participation to Pakistani investors in all capital and debentures issued after production is obtained. Domestic refining of 50 per cent of production is required when production reaches an agreed rate over a 6-month period. Other provisions restrict exports until domestic requirements are met and require training and employment of Pakistani nationals.

Islands Refinery

Filipino mission wants plant to stir industry

CONSTRUCTION of a refinery in the Philippines, a project considered by the government in the past, has been recommended by the Filipino Economic Survey Mission as one of several new industries needed in the republic.

The mission's report made public recently in Manila proposed a refinery with a daily capacity of 10,000 bbl. which would cost approximately Ps. 24,000,000 (about $12,000,000). It said the plant would save the Philippine economy some $12,000,000 annually in foreign exchange and would stimulate exploration for domestic crude sources.

Philippine officials have long sought to interest oil companies in projects which would give the islands their own oil industry. At present, the Philippine requirements amounting to some 27,500 bbl. daily, are met entirely by imports. Last year the republic passed a new oil law to promote exploratory work by private interests, but as far as is known no major operator has taken concessions. This law contained a refinery obligation effective if 140,000,000 bbl. of reserves were discovered.

Product pattern.—The product pattern in the Philippines includes considerable quantities of gasoline as well as diesel, lubricating, and fuel oils. Based on 1948 imports which averaged about 23,000 bbl. daily, gasoline makes up about 42½ per cent of the market, fuel oil (bunker) 22 per cent, diesel 21 per cent, and kerosine 10½ per cent.

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XUM

L.P.G. Pioneer

Thomas opened markets for Phillips in Detroit

R. W. THOMAS, Bartlesville, who is vice president of research and development of Phillips Petroleum Co., is known to the industry as one of the pioneers in the development of markets for liquefied petroleum gases.

He has had nearly a fourth of a century experience in the fields of manufacturing, development, and sales of petroleum chemicals. During 1926, he joined Phillips as construction superintendent, and successively became research engineer on liquefied petroleum gases, assistant director of research, and vice president and general manager of Philgas Co. This latter firm was later absorbed by the chemical products department.

During the early phase of his company experience he was assigned to Detroit where he was actively engaged for a number of years in the development of markets for liquefied petroleum gases.

In 1940 he was made president of Hycar Chemical Co., organized jointly by B. F. Goodrich Co. and Phillips. His present duties include supervision of research and patent activities.

William D. Lewis, General Petroleum Corp., has been appointed senior geologist in the Bakersfield, Calif., office. He has been with the company since 1945.

B. F. Stradley, secretary and treasurer for Phillips Petroleum Co., has been elected a member of the board and executive committee and named vice president and treasurer. He began his career with Phillips 26 years ago as a clerk in the oil-accounting section.

William C. Byrd, geophysicist in charge of computation and map making for Stanolind Oil & Gas Co., has been transferred from Jayton to Spur, Tex.

D. A. Dechman, production manager for Cities Service Oil Co. (Pa.), Gulf Coast division, has been transferred from Houston to Fort Worth in the same capacity. **K. E. Meyer,** production engineer at Houston, was also moved to Fort Worth.

Lee R. Jamison, engineer for Ohio Oil Co. at McFadden, Wyo., has been transferred to the South Coles Levee unit at Bakersfield, Calif., as process engineer.

Roger Ogden has been named district geologist for the South Louisiana district of Arkansas Fuel Oil Co.

G. A. Woods, formerly division engineer for Fish Constructors, Inc., Dallas, is now in Moose Jaw, Sask., Canada, where he is in charge of construction of an addition to British American Oil Co., Ltd.'s refinery for Process Engineers, Inc., Dallas. He formerly was located at Corpus Christi.

H. W. Brennan, Jr., formerly with Core Laboratories, Inc., and **John P. Byram,** Abilene independent oil operator, has opened offices in Abilene as a consulting petroleum engineer and geologist. Brennan is a graduate of Texas A. & M. College with a degree in petroleum engineering.

W. M. Braybrooks, superintendent of Gulf Oil Corp.'s Staten Island, N. Y., refinery, was recently presented with the Distinguished Citizen Award of Wagner College, in recognition of his many activities in behalf of community affairs and civic improvements.

Glen Fenton, drilling superintendent for Fenpar Exploration Co., has been transferred from Howell, Mich., to Greyling, Mich., in the same capacity.

E. J. Calhoun, former terminal superintendent for Sohio Pipe Line Co. at Mount Vernon, Ind., has been transferred to Haynesville, La., as station foreman for Mid-Valley Pipeline Co.

J. A. Jorgenson, Union Oil Co. of California, has been transferred from the geological staff of the firm's division office in Midland, Tex., to Roswell, N. M., where he will be district geologist.

Verdi H. Strawn, senior development operator in research for Sinclair Oil Co. in Chicago Heights, Ill., has been transferred to Harvey, Ill.

Robert J. Finney, staff assistant on petroleum refinery operations, has returned to the New York staff of Cities Service Oil Co. after serving with the Interior Department's Oil and Gas Division. He previously served as assistant manager at the company's Petty's Island, N. J., refinery.

J. B. Jarman, engineer for Service Pipe Line Co., has been appointed superintendent of materials in the operating department. He received a degree in civil engineering at Oklahoma University in 1927 and has been with Service since that time. He will report to **C. W. Butler,** operating superintendent. **G. V. Rohleder** will succeed Jarman as engineer, under **A. H. Newberg,** chief engineer.

A. W. Baucum has been named assistant to the vice president of The Texas Co.'s domestic producing department, and has been transferred from Houston to New York. Baucum, who was formerly assistant to the manager of the producing department, joined Texas Co. in 1934 after graduation from Texas A. & M. College. He was transferred to the South Texas division office in Houston in 1938; appointed division petroleum engineer of the Oklahoma-Kansas division at Tulsa in 1944; and named assistant division manager of the South Texas division in 1946.

W. E. Reed, Satanta, Kans., drilling superintendent for Stovall Drilling Co., Inc., has been transferred to Monroe, La.

R. A. Winslow has been appointed assistant head of the design group, process-engineering department of Esso Standard Oil Co.'s Baton Rouge refinery. Other changes include: **N. F. Black,** named general foreman of the new utilities department, which formerly was part of the butyl and utilities department, and also given charge of standby and storage activities at Plancor 152 plant; **G. F. Sellen** appointed division-foreman assistant; **J. B. McKemie,** named in charge of the operation of the butyl polymerization units; **L. B. Page,** named division foreman in charge of the isobutylene and diolefin-extraction units in the alcohol department.

PERSONALS

J. J. Travis, formerly district manager for the former Barnsdall Oil Co. in West Texas, has been placed in charge of the new office of Ryan, Hays & Burke in Midland. **Glen Schimmel** will be geological engineer attached to the office.

Ashton J. Mouton, Lafayette, La., has been appointed to serve on the Louisiana State Mineral Board. He succeeds **Edgar G. Mouton,** also of Lafayette, who resigned to accept a position with the Louisiana State Tax Commission.

John S. Ivy, Houston consulting geologist, has been named to a 4-year term on the board of governors of Rice Institute.

Wayne C. Davison, Rocky Mountain consulting geologist, has opened offices in Denver.

Harold C. Carmack, Rocky Mountain division manager for Loffland Brothers, has resigned, and **Bob Nicholas** will now handle the company's contracts. **Bob Tinsley** will be superintendent of drilling operations.

H. Y. McClure, J. R. Crump, and **P. A. Grant,** of Gulf Oil Corp., have been named assistant division geological supervisors of the Fort Worth production division. McClure was transferred to Fort Worth from Midland, and Grant from Amarillo. **L. E. Warren** was named zone geologist at Midland, Tex., where he has been stationed, and **Y. B. Newsom** was transferred from Fort Worth to Amarillo as zone geologist.

R. Q. Murph, formerly geological manager for Union Producing Co., Tyler, Tex., has joined Texas Crude Co. at Fort Worth.

J. A. Price, former division manager for Bay Petroleum Corp., Midland, Tex., has opened offices there as a consulting geologist and independent oil operator.

J. H. Bartley, former senior geologist in the Midland, Tex., office of the University of Texas Lands, has opened offices in Midland as a consulting geologist.

Gerald P. Salisbury, geologist at Denver for Union Oil Co. of California, has been transferred to Amarillo.

Bill Weidlein, Amarillo, engineer, has left for Italy where he will be consultant on an Italian Government natural-gas project.

D. F. Sears, Shell Pipe Line Corp., has been named assistant to the president, and will be in charge of special assignments, principally in connection with the construction of a crude-oil pipe line which is being built for Shell in Venezuela. Sears, also a director of the firm, joined Shell Pipe Line in St. Louis in 1927 as engineer. **A. F. Terrill** has been named area superintendent for Shell Pipe Line in West Texas with headquarters in Colorado City. He replaces **W. H. Shelley,** who has been named superintendent in charge of construction for Shell in Venezuela.

D. F. SEARS

A. F. TERRILL

H. S. M. Burns, president of Shell Oil Co., has been appointed to the 21-man petroleum industry committee on Military and Government Petroleum Requirements.

Ewell F. Hindman, formerly pipe-line superintendent of Louisiana Natural Gas Corp., has been appointed general manager of the company. Hindman for 20 years was with Arkansas-Louisiana Gas Co. in various operating and engineering capacities before he joined Louisiana Natural in 1949.

I. V. Morgan, station engineer at Cranfield, Miss., of Interstate Oil Pipe Line Co., has retired after 23 years of service.

Dr. Folkert Brons has joined Shell Oil Co.'s exploration and production-research division, and will work under **J. P. Murphy** on liaison and coordination of production research. He will succeed Murphy later in the year as associate director of production, when Murphy leaves for an assignment to the Pacific Coast regional staff. **H. J. Olympius** has been transferred from the Wilmington, Calif., refinery as manager of the stores department to the Wood River, Ill., plant in the same capacity. **W. H. Meissner,** St. Louis division, has been transferred to the Wilmington refinery as manager of the stores department replacing Olympius.

R. C. Underwood has been named superintendent of Sunray Oil Corp.'s refinery at Duncan, Okla., and **Aultman T. Smith** has been named assistant superintendent. Underwood joined the firm in 1947 as assistant refinery superintendent, and formerly was with Associated Refiners, Inc., former operators of the Sunray plant. Smith joined Associated in 1943, and went with Sunray in 1947 as shift superintendent.

Sam H. Stith has joined Sinclair Oil & Gas Co. at Evansville, Ind., as senior geologist. He was formerly with Sun Oil Co.

A. J. Monzingo, formerly petroleum engineer in Magnolia Petroleum Co.'s Kermit producing district, has been transferred to the company's West Texas division offices at Midland as a petroleum engineer. He has been succeeded by **E. G. Bilderback, Jr.,** formerly petroleum engineer at Luling, Tex.

John A. Veeder has been named district geologist by Amerada Petroleum Corp. for the Permian basin of West Texas, replacing **Carl Barnhart,** who has been transferred to an executive position in Tulsa. **Everett Carlson** has been transferred from the San Antonio office to the Midland, Tex., geological staff for the Permian basin district, and **James LeRoy Harden** and **Lawrence Myers** have been added to the geological department in Midland.

F. H. MATTHEWS

Fred H. Matthews, Tide Water Associated Oil Co., San Francisco, has been named manager of the crude and products department of the western division. He will be in charge of purchases and exchanges of crude oil and products and will be a member of the division's operating and production committees. He succeeds the late Harry T. Earl.

Dr. Gustav Egloff, director of research, Universal Oil Products Co., Chicago, has been elected a member of the Society of American Military Engineers, Washington, D. C.

A. L. Gillreath has resigned as district foreman in the Goliad, Tex., area of Continental Oil Co., to join with **C. R. Ballard** of Ballard Well Service, in forming B. & G. Well Service, with headquarters at Peters, Tex. Gillreath started his field work

XUM

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PERSONALS

with Sinclair Oil Co. in 1923, and later joined Continental in 1943.

Walter R. Richardson, Wilson, Okla., district gager for Interstate Oil Pipe Line Co., has been named chief engineer at the Tussy, Okla., station, and **Joe Marshall,** Wewoka, Okla., district gager, has been named chief engineer at the Oklahoma City station.

W. F. Davis, currently on loan from Interstate Oil Pipe Line Co. to Lakehead Pipe Line Co. as assistant manager, was recently named manager of the latter firm.

William M. Fleetwood has been named assistant to **C. D. Miller,** executive vice president of British-American Oil Producing Co.

Allan Whitney has assumed the duties of administrative assistant to the general superintendent at Esso Standard Oil Co.'s Bayway refinery, Linden, N. J., relieving **Gordon R. Dalglish,** who is now on military leave of absence.

Gordon Kiddoo has been appointed director of research and development for Continental Carbon Co., Amarillo. He was formerly associated with The Texas Co. in chemical engineering process work, and later with Hydrocarbon Research, Inc., at the Olean, N. Y., laboratory in development work on hydrocol process.

Frank Tuttle has resigned as compressor station superintendent for Cities Service Gas Co. at Straight, Kans., to join Michigan - Wisconsin Pipe Line Co. **George Arterburn** was transferred as superintendent from Matfield Green., Kans., to the Straight station. Other changes include: **Dave Frederick,** transferred from the Wichita compressor station to the Matfield Green station as superintendent; and **C. S. Smith,** transferred from the Caney, Kans., compressor station to the Wichita compressor station as superintendent.

John R. Miller has resigned as area geologist for Stanolind Oil & Gas Co., Casper, Wyo., and has joined the Rocky Mountain geological staff of Pacific Western Oil Corp., with headquarters in Casper.

Robert M. Hutchison, director of research and safety for Houston Natural Gas Corp., has been elected president of the Engineers' Council of Houston, and **M. I. Kearns,** of Brown & Root, Inc., has been elected cochairman of the council's public-affairs committee. **Arthur Levy,** consulting petroleum engineer, has been elected chairman of the subcommittee on water supply.

Walter H. Davidson, superintendent of construction for Transcontinental Gas Pipe Line Corp., Houston, has been appointed general superintendent of the company's Texas-to-New York City natural-gas line. **Raymond Crowe,** formerly with Stone & Webster, independent engineers on Transcontinental construction, has been appointed chief engineer, and **F. B. Haverfield,** formerly with Continental Oil Co., has been named superintendent of compressor stations.

W. O. Twaits has been elected a director of Imperial Oil, Ltd. Twaits joined the company at Sarnia, Ont., Canada, in 1933 after graduating from the University of Toronto. He became production controller in 1940, and after several other appointments was transferred to Calgary in 1949 as management assistant in the producing department.

H. F. Alberty, subsurface geologist, Shell Oil Co., has been transferred from Houston to New Orleans. Other changes include: **R. R. Barr,** drilling foreman, transferred from Houston to Midland, Tex.; **C. C. Cole,** chemist, Sheridan, Tex., cycling plant, moved to Provident City, Tex.; **H. J. Hill,** junior exploitation engineer, named exploitation engineer, Houston region; **G. W. Leflar, Jr.,** junior gas engineer, named gas-test engineer at Houston; **L. B. Lesem,** junior mechanical engineer, named field gas engineer at Houston; and **D. D. Stokes,** laboratory technician, transferred to the Houston regional department.

James McCrory, Alabama division manager, Pan-Am Southern Corp., has been elected state chairman for 1950-51 of the Alabama Petroleum Industries Committee.

R. E. Nielsen, mechanical engineer, and **A. S. Rumfola,** chemist, have joined the staff of Shell Oil Co. at Houston.

Charles J. Power, geological scout and land man of Union Producing Co., has been appointed assistant superintendent of the general office land and lease department in Shreveport. He joined the company in 1928.

C. A. (Chuck) Reglin has been appointed superintendent for Hiawatha Oil & Gas Co. in West Texas, having charge of drilling and production operations at the Midland office. He was formerly with Standard Oil Co. (Texas), located at La Porte.

Hugh A. Tanner, pioneer Permian-basin geologist, has joined Warren Oil Corp., Midland, Tex. He was formerly with Hiawatha Oil & Gas Co. and Ohio Oil Co. in Midland.

John W. Olvey, Shreveport oil operator, was elected vice president and reelected to the board of directors of Marine Oil Co., El Dorado, Ark.

Charles W. Hancock, production engineer with Pure Oil Co., has been transferred to Tulsa from Jal, N. M.

C. D. Daniels, president of Albercan Oil Corp., has been made president of Royalite Oil Co., Canada, succeeding **S. F. Herd** who retired as both president and managing director. Daniels was formerly president of Pancoastal Oil Co., Venezuela.

Robert T. Rushmore and **Gerald Tresner,** independent oil operators, have opened offices in Denver.

R. P. Davidson and **S. J. Tyron** have been named assistant managers of the land department, Rocky Mountain Division, for General Petroleum Corp.

Ralph K. Davies, president, American Independent Oil Co., San Francisco, has been asked by Secretary of the Interior Chapman to take over the task of mobilizing the nation's oil and gas industries. He served as deputy petroleum administrator during the last war.

DEATHS

Harry Sprague, Superior Oil Co. geologist, was among the 50 persons killed August 31 in a plane crash near Cairo, Egypt. He had been in charge of the company's Cairo office for several years and was en route home preparatory to a transfer to Calgary, Alta., Canada.

Collin P. Davis, 62, Tulsa independent oil and royalty dealer, died September 7 in Oklahoma City.

Lester G. Wheeler, 65, Payne County, Oklahoma, oil man, died recently.

R. A. Lerch, 30, member of a drilling crew for Appell Drilling Co., died September 1 near Falfurrias, Tex.

Herman I. Axelrod, 65, president of Marlow Oil Co., and Gibson Machine & Tool Co., died September 5 at Borger, Tex.

James C. Ellis, 66, independent oil operator, died September 1 in Dallas.

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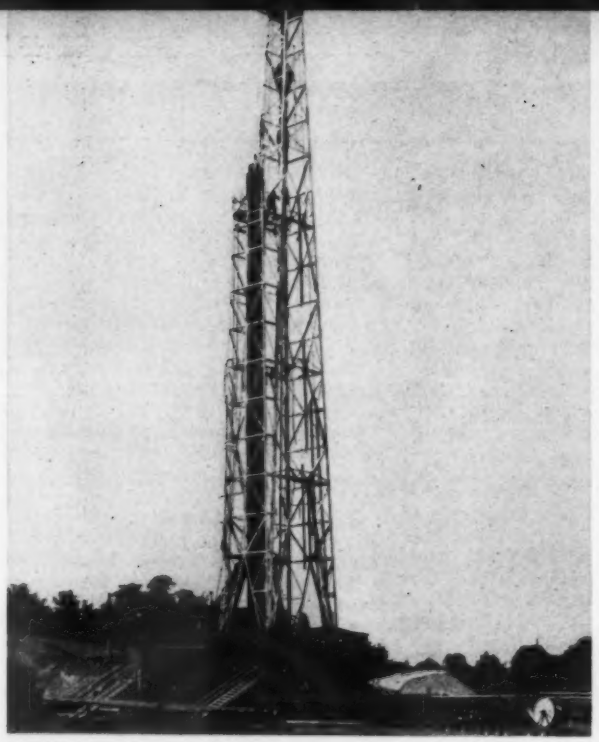
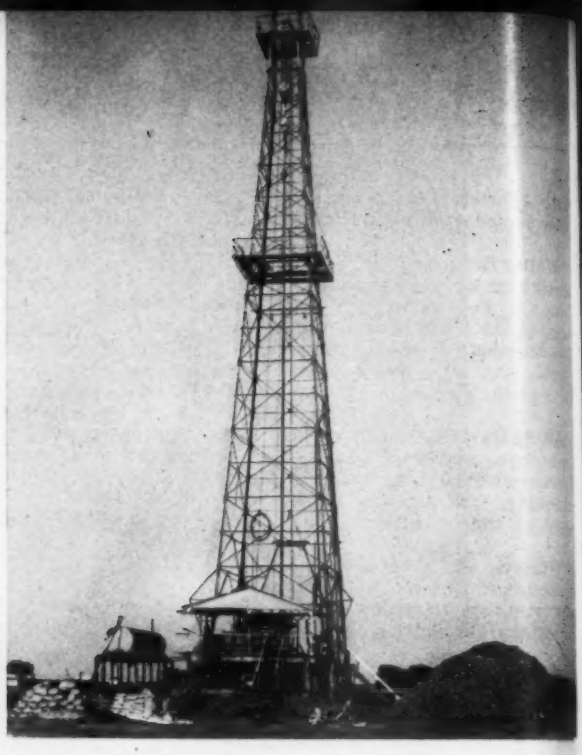




Left, above: Harbar Drilling Co., Wichita, here is strung out on a new location in active Ringwood field. This is one of the most active individual pools, in current drilling operations, in the Mid-Continent area. Right, above: Warren-Bradshaw Drilling Co., Tulsa, has just moved rig onto this new location for Mazda Oil Co., Tulsa.

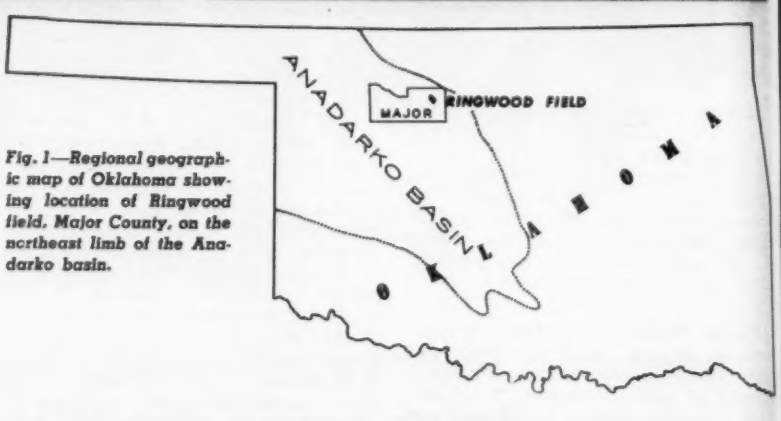


Fig. 1—Regional geographic map of Oklahoma showing location of Ringwood field, Major County, on the northeast limb of the Anadarko basin.

by Joseph A. Kornfeld
District Editor

35 RIGS DRILLING IN RINGWOOD FIELD

To date 95 wells have been drilled in this sprawling field, and 657 remain to be drilled within its proven boundaries

SPRAWLING over four townships, Ringwood oil field in Major County may cover more than 30,000 acres of productive area on ultimate development. More than 35 drilling rigs operated by 18 independent oil operators are proving up an area extending for a length of more than 10 miles and up to 6 miles in width.

In an area estimated ultimately to cover more than 47 sq. miles, proved developed acreage exceeds 3,800 acres. More than 41 sq. miles or 26,260 acres, are represented in the remaining proved undeveloped acreage.

On the basis of a uniform density of 40 acres per well, it is estimated that 752 wells will be required to develop this fast-growing area to fill in the field outlines marked by present widely scattered extensions. Of the total number of wells, 95 are completed oil wells proving 3,800 acres. This leaves 657 wells to be drilled within the proven boundaries of the field. To date, no dry holes have been drilled inside of the Ringwood area.

Although the only field outlet serving Ringwood is by trucks to the Champlin Refining Co. refinery at Enid, plans for building a pipe-line outlet are being studied. The economics of a natural-gasoline plant have been analyzed by executives of two leading gas-distributing companies but no definite decisions have been announced.

Development

Manning.—Ringwood field was discovered on December 20, 1945, by Superior Oil Co. 41-27 Manning, NE NE NW 27-22n-10w. Originally, this well was drilled to a total depth of 8,274 ft. in the second Wilcox series topped at 8,113 ft. Fair porosity and stainings were logged from 6,113-17 ft. in the Oswego series and also from 7,698-99 ft. in the Hunton lime topped at 7,693 ft. Truncated Manning zone was logged from 6,700-34 ft. Planned as a deep hole, Manning 41-27 set the 11¾-in. surface pipe at 2,314 ft. and

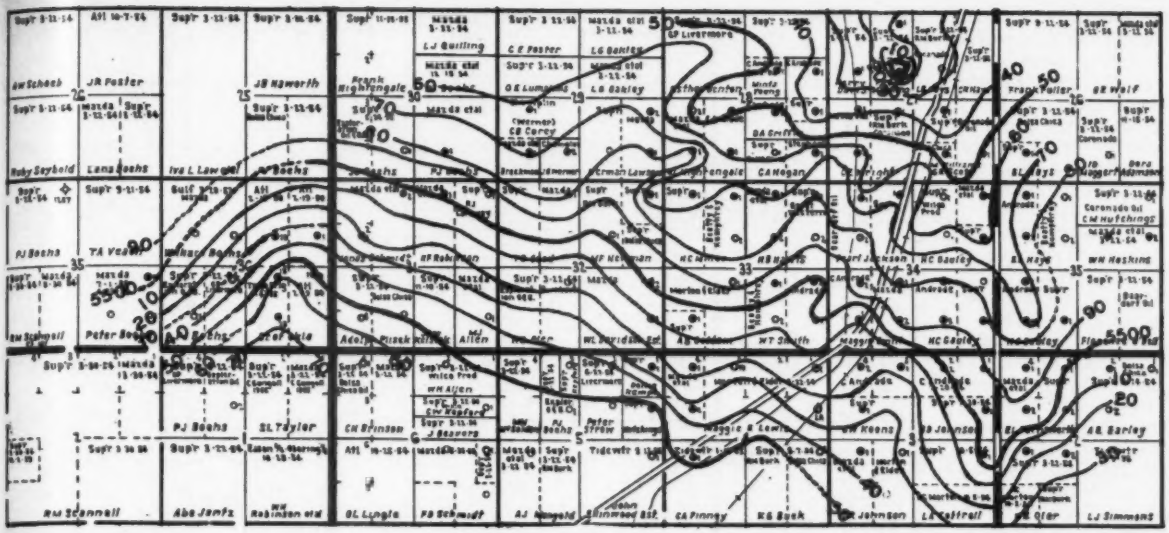


Fig. 2—Subsurface structure contour map of Ringwood field mapped on top of the Manning unconformity. Datum is sea level and the contour interval is 10 ft. (Base map, courtesy Little Oil Maps, Oklahoma City).

carried open hole to 6,700 ft. where the 6⅝-in. oil string was set and cemented on top of the Manning. The well was shot with 90 qt. from 6,705-35 ft. opposite the Manning, and was completed flowing 43 bbl. of oil in 24 hours, cutting 6 per cent water. It was later worked over and reshot with 200 qt. of nitroglycerin.

Development of the field did not receive a major impetus until May 24, 1949, when the productive area was extended 3 miles westward. On acreage farmed out from Superior, Mazda Oil Corp. completed 1 P. J. Boehs, NE SW SE 30-22n-10w, flowing 82 bbl. of 39°-gravity oil on a ½-in. choke from 6,789-6,800 ft.

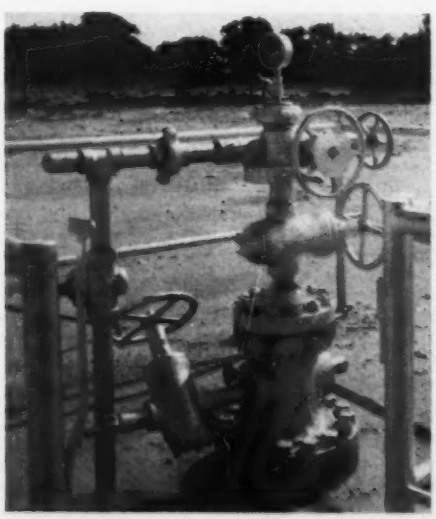
Another major extension was completed during November 1949, 1 mile southwest of the Mazda discovery, at C. Andrade III (now Atlantic Refining Co.) 1 School Land, NE SE NE 36-22n-11w, for 102 bbl. of 38°-gravity oil from 6,790-6,900 ft.

The fourth of a series of discoveries was finaled on December 27, 1949, 2 miles southwest of the original discovery well, by Superior 1 A. B. Cottom, NE SW SW 33-22n-10w, flowing 306 bbl. oil in 24 hours, through a 13/16-in. choke from perforations at 6,828-88 ft. in the Manning.

Two major extensions for the Manning reservoir were completed during the summer of 1950. Four and one-half miles southwest of the field proper, Superior completed 63-30 W. A. Fuller, NE SW NE 30-21n-10w, pumping 38 bbl. oil per day from perforations at 6,985-95 ft. and from 7,025-45 ft. to open a new producing area. Superior reported completions of another discovery oil well located 3½ miles southwest of the School Land sector during July. Its 1 Stanley Coppock et al, NE SW NE 9-21n-11w, is reported to have flowed 18 bbl. per day from casing perforations from 6,905-40 ft., 6,951-56 ft., and from 6,965-80 ft.

Lower Manning Reservoir. — Productivity of the lower Manning reservoir was evaluated during July 1950 by Mazda 1 Harman heirs, NE NW NW 16-21n-10w. It swabbed and flowed approximately 100 bbl. of oil in 18 hours after treatment with 15,000 gal. of acid through casing perforations from 7,052-7,110 ft. (342 shots) in lower Manning pay topped at 7,052 ft. (—5,818 ft.). This zone is

Left: Neat layout of surface equipment followed by Superior Oil Co. of California at Ringwood. Three wells are producing into the separator-tank battery (3,000-bbl. capacity). The building in left background is switchers' doghouse. Right: Closeup of christmas tree on Superior's Farnsworth lease.



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found at 74 to 79 ft. below the base of the Manning zone proper. In the Harman heirs well, 57 ft. of gross lower Manning section was logged. Completion was made in the Manning zone proper.

Maremac reservoir. The third producing oil reservoir at Ringwood is the Maremac series of the Mississippian, logged 260 ft. below the base of the Manning sand proper. First official completion from this reservoir was reported July 31, 1950, by Tide Water Associated Oil Co. 1 R. G. Loomis, NE NE SE 5-21n-10w. From Maremac sand, the well flowed 6½ to 9 bbl. of 38.6° oil per hour through various chokes during an 8-hour test following treatment of the pay zone with 5,000 gal. of acid. The top of the Maremac series was found at 7,165 ft. (—5,919 ft.). However, the well was plugged back and completed in the Manning series.

Productive limits of the Maremac reservoir were extended 4 miles to the west by Mazda on August 10, 1950. Its 1 Scannell, NE NE NE 3-21n-11w, flowed 45 bbl. of oil in 24 hours after acid treatment with 5,000 gal. opposite casing perforations from 7,200-50 ft., and from 7,250-75 ft.

Shallower objectives. — The Pennsylvanian is being studied for the possible existence of oil and gas reservoirs at Ringwood. At least two wells drilled on the west side of the field have shown oil stainings in drill cuttings in the Stalnaker sand found at an approximate depth of 5,350 ft., or at a level of 1,440 ft. above the Manning zone proper, as follows:

Operator and well—	Top of Stalnaker sand
Tide Water Associated 1 R. G. Loomis, NE NE SE 5-21n-10w	5,350 ft. (—4,104 ft.)
Trigg Drilling Co. 2-B School Land, NE SW SE 36-22n-11w	5,368 ft. (—4,092 ft.)

Although no drill-stem tests or cores are reported to have been taken in this formation, operators in this sector of the field plan thoroughly to test the Stalnaker and other Pennsylvanian sands on future wells.

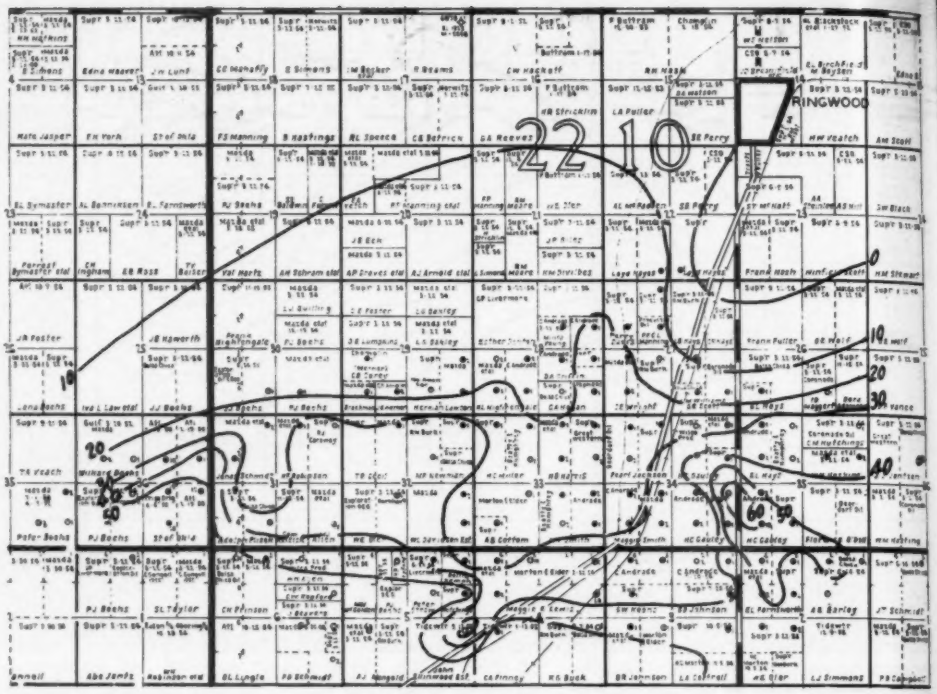


Fig. 3—Net effective saturated oil pay isopachous contour map, Manning reservoir, Ringwood field. Contour interval 10 ft. (Base map, courtesy Little Oil Maps, Oklahoma City).

Geology

Structure.—Ringwood field lies on the northeast limb of the Anadarko basin. Locally, southward-plunging terraces have disturbed the Pennsylvanian and Mississippian sediments. The attitude of these terraces shows broad areas and gentle dips. Ringwood is situated on one of these features.

An average dip of 70 ft. per mile, in a generally southward direction, has been measured on the base of the Manning zone.

Structure is that of a stratigraphic trap combined with a terrace. Early Pennsylvanian erosion has truncated the Manning zone entirely to the northeast to create the trap. The attitude of this unconformity is only 40 ft. per mile with the plane dipping S. 20° W. The effect of this southwestward tilt is to allow post-Maremac formations of Chester, Springer, and possible Morrowan age to appear in the geologic column below the unconformity south and west of Ringwood.

The existence of an unconformity above the Manning zone is proven by the following conditions: (1) the regional extent of the unconformity, (2) an angular, unconformable relationship existing between the Manning zone and overlying formations, (3) a conformable relationship among the interzone members of the Manning with its base which points towards truncation instead of sedimentary wedges to account for narrowing of Manning zone thickness to the northeast, (4) the role of secondary dolomitization along bedding planes, joints, and fractures to create permeability, and (5) recognition of unconformity lithology in samples from above the Manning zone, conglomerate, detrital chert, and sand.

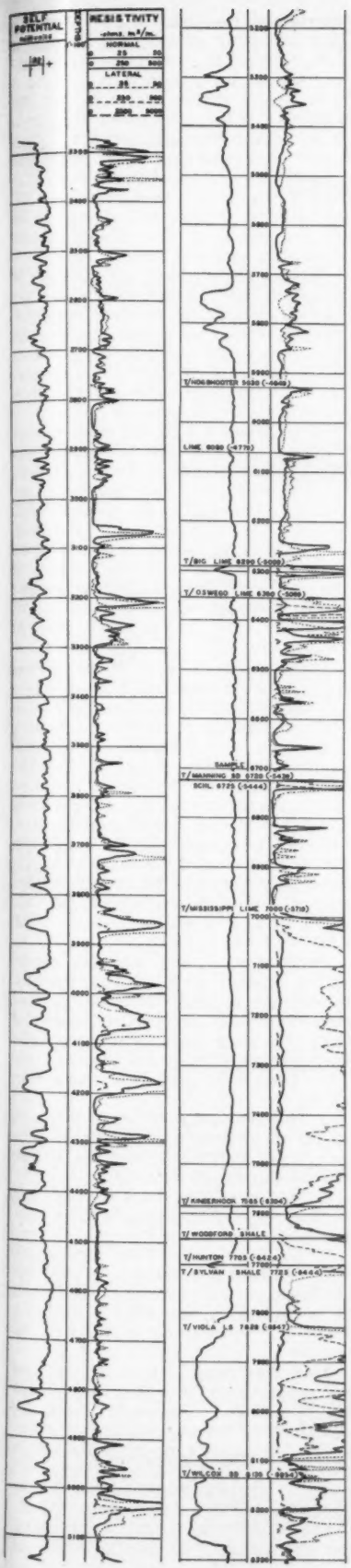
Stratigraphy.—The surface rocks at Ringwood are Permian. In the stream beds there is a cover of Pleistocene gravels. The Permian system is represented by 3,900 ft. and the Pennsylvanian by about 2,700 ft. of sediments. Pre-Pennsylvanian rocks logged in several deep wells drilled in or near the field may be generalized as follows:

Formation—	Thickness (ft.)
Mississippian	635
Woodford	60
Hunton	15
Sylvan	120
Fernvale-Viola	20
Simpson (not completely penetrated) (est.)	650

In the upper part of the Mississippian system, rocks of Maremac and Chester age have been logged on the northeast flank of the basin. These comprise the reservoirs now producing at Ringwood. The Chester age of the Manning has not been accepted by all geologists. Some petrographers assign a Springer or Morrowan (Pennsylvanian) age correlation to the Manning zones.

The Manning varies from zero at its northeastern edge of the field to a maximum known gross section of 177 ft. in the southwest part of the field. Stratigraphy has been summarized as follows:

> **Upper zone: LIMESTONE,** dense to coarsely crystalline, oolitic, crinoidal, with bryozoa, brachiopods, and a few ostracods. Frequent shale streaks. Few siltstone lentils. Limestone impervious, except where permeability has been



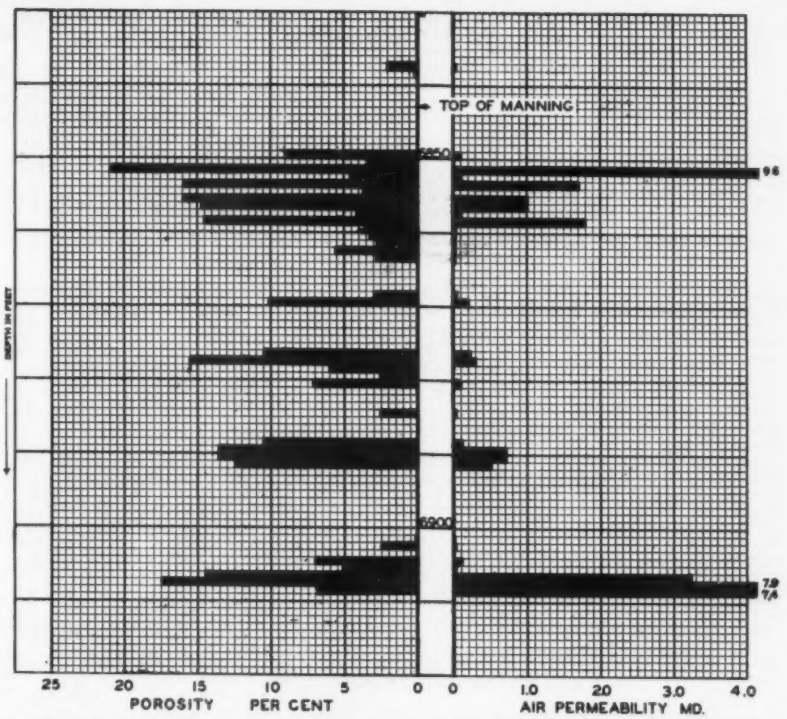


Fig. 5—(Above) Chart showing porosity and permeability profile for a well cored in Section 31-22n-10w, Manning reservoir, in Ringwood field.

brought about by secondary dolomitization occurring along bedding planes, fractures and joints. Maximum thickness 75 ft.

Lower zone: LIMESTONE, with intercalations of streaks of siltstone ranging from 2 to 15 ft. in thickness, and shale members varying from paper-thin to 10 ft. which are correlatable for short distances. Sandy phase thickens eastward. Maximum thickness 50 ft.

Above the Manning unconformity lies a blanket zone of shale ranging from 40 to 100 ft. It is Atoka (Pennsylvanian) age. Lithology is black, chunky shales at the top grading downward into green and red shales with occasional thin green dense limes and siderite.

Drilling Practices

Drilling contractors. — Among the drilling contractors active at Ringwood are: L. B. Jackson, George P. Livermore, Loffland Brothers, Harbar Drilling Co., Warren-Bradshaw, Webster Drilling Co., and Williams-Copeland.

Well spacing.—The spacing pattern employed in the development of

Fig. 4—(Left) Type electric log for updip sector of Ringwood field, showing formations extending from the surface down into the Ordovician Simpson series. The well is Superior Oil Co. 1 G. E. Scott, NE NW SE 27-22n-10w, total depth 8,310 ft., completed July 10, 1947, in the Manning reservoir. Mud resistivity is 1.8 ohms m²/m. at 70° F., and electric spacings are AM—16 in., OA—15 ft. Surface elevation 1,293 ft., k.b.

Neal Among First to See Ringwood's Potentialities

One of the first geologists in the Mid-Continent area to recognize the Ringwood prospect as a stratigraphic trap was E. P. Neal, Tulsa, district geologist, Tide Water Associated Oil Co. He is assigned to northern and eastern Oklahoma, Kansas, and the northern Panhandle area of Texas. Neal has been associated with the geological department of Tide Water for the past 13 years and was district geologist in Wichita, Kans., during 1944 to 1947. His company experience throughout various portions of the Anadarko basin gave him an excellent background for the regional approach to the Ringwood problem. During the fall of 1947, Neal prepared dip cross-sections from both sample and electric logs across the northeast limb of the basin. The discovery well of the Maremac reservoir, Tide Water 1 R. G. Loomis, NE NE SE 5-21n-10w, was located on acreage originally acquired on his recommendation. Neal was born in St. Louis, August 20, 1903. He studied engineering at Rice Institute, Houston, but received his degree of B.S. in geology from University of Tulsa in 1940.

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TABLE 1—SUMMARY OF WELLS AND ACREAGE, RINGWOOD OIL FIELD, MAJOR COUNTY, OKLAHOMA
(Status as of August 15, 1950)

Twp. & Rge.	Wells: Proved developed	Wells: Proved undeveloped	Wells: Ultimate	Acreage: Proved developed	Acreage: Proved undeveloped	Acreage: Ultimate
21n-10w	31	269	300	1,240	10,760	12,000
21n-11w	2	279	281	80	11,160	11,240
22n-10w	57	82	139	2,280	3,260	5,540
22n-11w	5	27	32	200	1,080	1,280
Totals	95	657	752	3,800	26,260	30,060

TABLE 2—DRILLING-ACTIVITY ANALYSIS BY OPERATORS, RINGWOOD OIL FIELD, MAJOR COUNTY, OKLAHOMA
(Status as of August 15, 1950)

Operator—	Lcn.	Rig up	Drlg.	Cpltg.	Total
Beatty, E. E., and J. A. Humphrey	1	0	3	0	4
Bolsa Chica	4	0	1	2	7
Burkhart et al.	0	0	1	0	1
Burk, R. M.	0	0	1	0	1
Caraway, R. J.	0	0	1	0	1
Coronado Oil Co.	2	0	0	1	3
Deardorf & Maguire	0	0	1	0	1
Exploration Oil & Gas Co.	0	0	2	0	2
Great Western Co.	0	1	0	0	1
Livermore, George P.	0	0	1	1	2
Mazda Oil Corp.	3	1	4	6	14
Morton, Harold C.	0	1	0	0	1
Morton & Elder	1	1	1	1	4
North American Car Corp.	0	0	2	0	2
Superior Oil Co.	4	0	1	1	6
Tide Water Associated Oil Co.	0	0	0	1	1
Williams-Copeland, Inc.	0	0	1	0	1
Wilco Production Co.	0	0	1	0	1
Field totals	15	4	21	13	53

TABLE 3—SUMMARY OF RESERVOIR DATA, RINGWOOD OIL FIELD, MAJOR COUNTY, OKLAHOMA

	Manning	Maremac
1. Average producing depth, feet (actual	6,780	7,165
2. Average producing depth, feet (subsea)	—5,500	—5,919
3. Geologic age	Mississippian	Mississippian
4. Probably reservoir mechanism	Sol. gas drive	Sol. gas drive
ACREAGE		
5. Spacing pattern (acres per well)	40	40
6. Proven developed (acres)	3,800	
7. Proven undeveloped (acres)	26,260	
8. Total proven (acres)	30,040	
DEVELOPMENT		
9. Wells: number developed	15	
10. Wells: number to be drilled	657	
11. Wells: ultimate number (estimated)	752	
MEDIA DATA		
12. Average porosity, per cent	14	
13. Average permeability to air, md.	10	
14. Average interstitial water, per cent	22	
15. Average original stock-tank oil in place(bbl./acre-foot)	1,060	
PRODUCTIVE RELIEF		
16. Highest productive structural contour, ft. subsea	—5,413	—5,911
17. Lowest productive structural contour, ft. subsea	—5,550	—5,919
18. Present productive relief	137	
BOTTOM-HOLE TEMPERATURES		
19. At depth of 6,897 ft., °F.	119	
20. At depth of 7,282 ft., °F.		138
STOCK-TANK OIL PRODUCED GRAVITY		
21. Average produced stock-tank oil gravity, (°A.P.I.)	42	38.6
BOTTOM-HOLE PRESSURES		
22. Maximum observed b.h.p./psig. (at datum of —5,400 ft)	2,428	

Ringwood field followed that selected by the discovery operator. Superior Oil Co. drilled 1 Manning in NE NE NW 27-22n-10w. With the exception of two 10-acre offsets drilled to the discovery well, the field has been developed on a 40-acre density.

Rigs.—Portable drilling rigs and jackknife masts are popular practice at Ringwood. However, in a few cases, 124-ft. derricks with 24 by 24-ft. bases are employed. In the northeast sector of the field where high-pressure gas sands have been logged, it is common practice to set a blowout preventer in the cellar.

Prime movers are internal-combustion engines using natural gas or butane for fuel. One prominent contractor is using a 240-hp. diesel rig from which he has obtained good performance data.

Bit record.—An average of thirty-eight 9-in. rock bits are used to drill a 6,800-ft. Manning well. This is an average of 165 ft. per bit. However, the number of rock bits required may vary from 30 to 42, depending upon many factors. A limiting amount of coring has been done, principally in the Manning. Usually three to four cores are cut in this section. Only one well is reported to have cored the Meremac reservoir thoroughly. Total drilling and coring time may average 450 hours. Total elapsed time from spudding to setting the long string ranges from 38 to 40 days.

Casing and cementing program.—A surface string of 10¾-in. pipe is set at depths ranging from 270 to 400 ft. During the early development of the field no intermediate string was considered necessary and open hole was carried to the base of the Manning. The oil string of 5½ or 7-in. pipe is set through the Manning and gun-perforated for completion.

In wells drilled recently on the east side of the field, 13-in. conductor pipe is set through shallow water sands and cemented with 100 sacks. The 9⅝-in. surface string is carried to 360 ft. where it is cemented with 225 sacks. The 5½-in. oil string is set at the base of the Manning and cemented with 500 sacks.

When existing Manning sand wells, now equipped with 5½-in. pipe, are carried deeper to the newly discovered Maremac reservoir, it may be found necessary to run from 335 to 375 ft. of flush-joint 4½-in. o.d. liner for recompletion, allowing a 75-ft. lapover inside the pipe.

Mud practice.—A water-base mud is used to drill the Permian and Pennsylvanian. Mud weight is held to 9.5 to 9.7 lb. per gal. and the viscosity from 38 to 44 seconds A.P.I. In drilling through the Permian, Impermex and caustic soda are added to condition the mud on account of the salt, anhydrite, and other evaporites. Viscosity is increased to 55 seconds A.P.I. to prevent loss of circulation.

High-pressure gas sands.—Four wells have encountered high-pressure gas sands in both the Pennsylvanian and Mississippian sections. Stephens Petroleum Co. 1 Hays, SE SE SW 22-22n-10w, north offset to the discovery well of the field, required five squeeze jobs to shut off gas from a sand body in the Pennsylvanian, believed to correlate with the Perry. On the east side of the field, blowouts have been experienced at Humphrey-Beatty 1 E. L. Hays, NE SE NW 35-22n-10w, and at Willco 1 Gauley, NE NW NE 34-22n-10w.

Perforating.—At Ringwood, perforating practice employs both conventional and jet-type methods. A shot density of six per foot. is used for both Manning and Maremac zone completions. The usual job will require from 370 to 400 shots depending upon:

1. The geologic position of the well in the field, which is related to the amount of truncation and the extent of secondary dolomitization;

2. The gross thickness of Manning section which is dependent upon conditions in item 1; and

3. The type of well log run which will influence the selection of individual zones to be perforated, although in many cases, the entire Manning zone is perforated from top to bottom.

Acid treatment.—Due to the low permeability of the Manning, lower Manning, and Maremac sections, nearly all of the completions at Ringwood require treatment with large quantities of acid. The volume will range from 15,000 to 35,000 gal. per well, injected in a single stage. Treating pressures may reach 1,200 psi. and the formation will break down at

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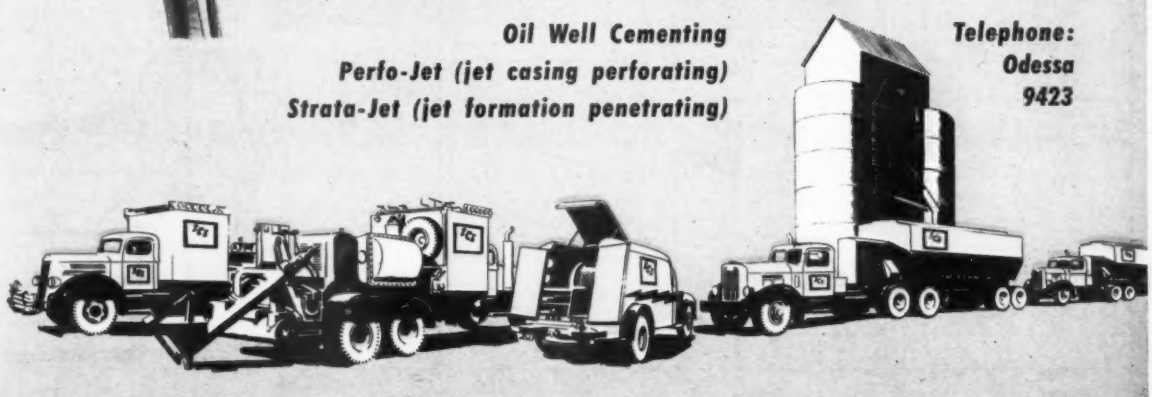

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about 400 psi. However, there may be significant variations from these figures. Permeability profiles have been run in at least six wells to date to evaluate the effectiveness of each acid job.

Manning reservoir. — Reservoir mechanism in the Manning zone is that of a solution gas drive. Evidence of the operation of this mechanism at Ringwood is the rapid decline in bottom-hole pressures and a complementary rise in produced gas-oil ratios. There was no original gas cap present in this reservoir. An oil-water contact has not been recognized.

Reservoir performance has been poor in the vicinity of the discovery well, Superior 1 Manning, NE NE NW 27-22n-10w. Bottom-hole pressure has declined from an original observed value of 2,428 psig. (datum 5,400 ft. subsea) to an average of less than 1,000 psig. in this sector. Simultaneously, an artificial gas cap has been created in this area.

Characteristics of buildup of bottom-hole pressure vary in different sectors of the field. This condition is due to the combined effect of truncation of the Manning series (which has progressively reduced the gross Manning section from 177 ft. in the sonthwest portion to zero in the northeast sector) and the low permeability of the Manning sediments. Reference is made to an accompanying chart which shows the low magnitude of porosity and permeability values. (Fig. 5.)

An increment of 134 psi. per day in the magnitude of the static bottom-hole pressure was noted between the 23-hour and 47-hour static pressure observations in a well tested during the summer of 1948 in Section 34-22n-10w.

However, in a well tested 4 miles to the west, Atlantic "C"-1 School Land, NE NE SE 36-22n-11w, during February 1950 an increment of 60 psi. per day was observed between the 24 and 48-hour interpolated shut-in pressure values.

Initial well size.—Although many wells have been completed in the Manning reservoir for initial well sizes as high as 150 bbl. per day, the decline in production is sharp. The flowing life of the average Manning well is a matter of a few months. The shape of the decline curve resembles that of a typical brown dolomite completion in Panhandle, Texas, field but several engineers believe that considerable oil will be produced during the late life of the well.

Little is known of the sustained flowing characteristics of either the lower Manning or the Maremac reservoirs due to the limited gages taken on either zone. Reference is made elsewhere in this article to initial tests.

Maremac reservoir. — Despite the low produced gas-oil ratio recorded in the discovery well for this reservoir, the low permeability values known from limited core date in the Maremac may preclude the operation of a limited water drive. Whether or not an original gas cap exists updip is not known at this writing and those wells which reached the Maremac to the north of present productive limits penetrated only a short distance into this formation.

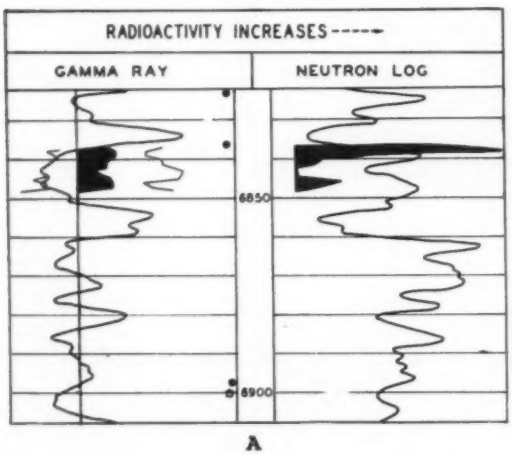
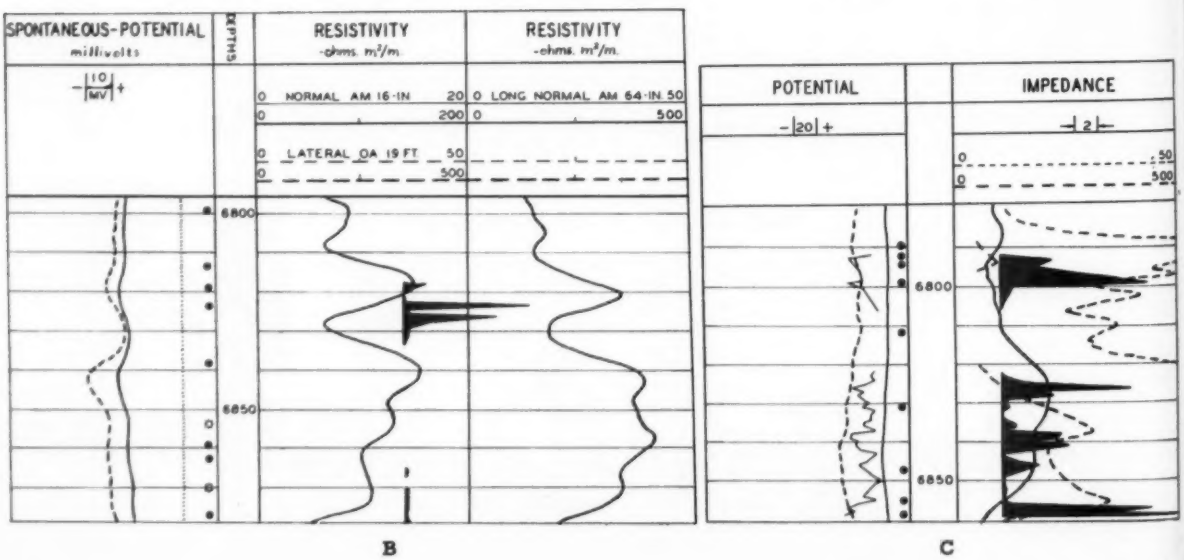


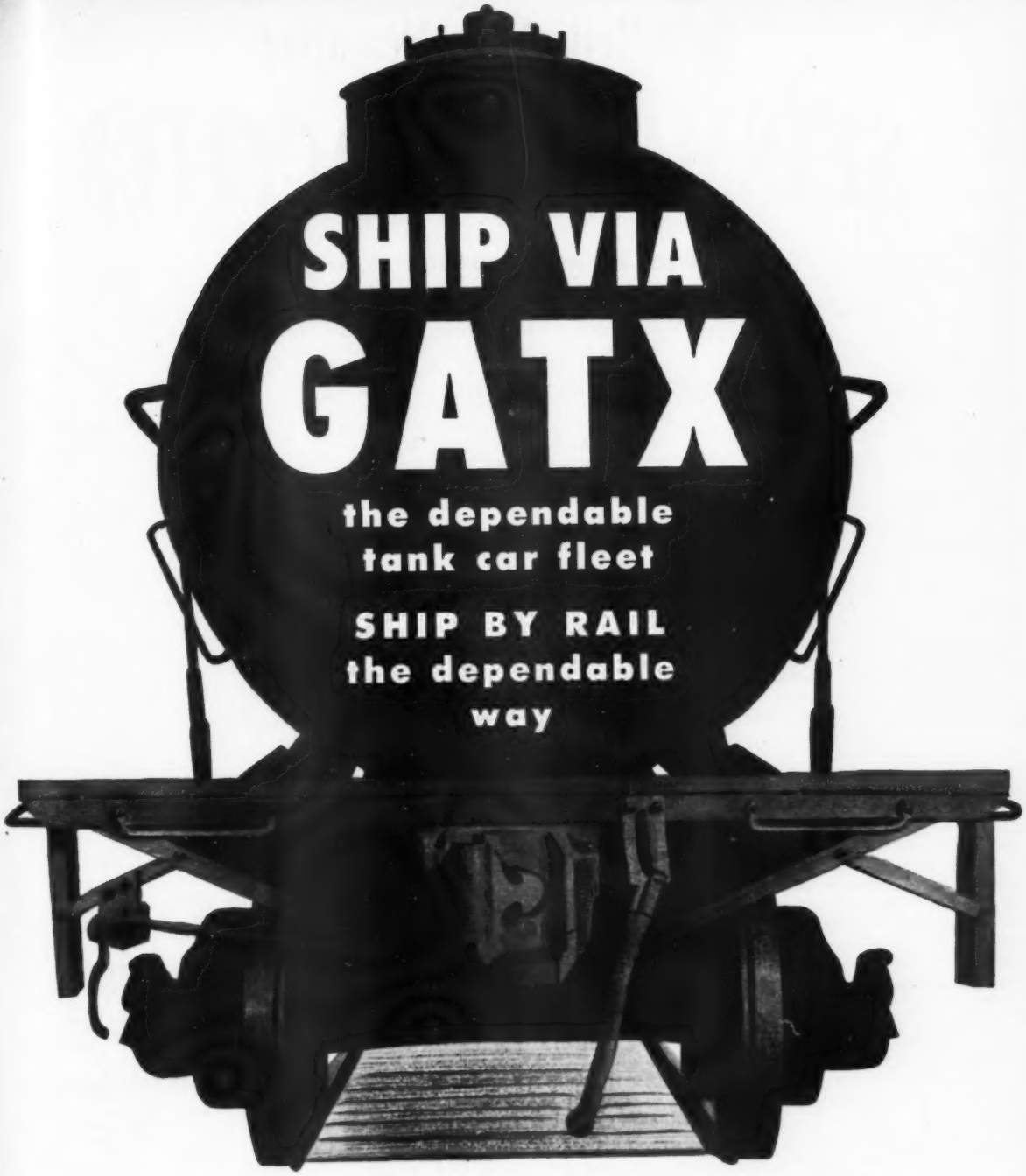
Fig. 6—West-east pay detail cross-section, showing permeability profile, and electric and radioactivity logging characteristics of the Manning reservoir, Ringwood field. Wells in line of section are shown above as follows: A—Superior Oil Co. 81-5 No. 1 Kemph, NE NE NE 5-21n-10w, total depth 6,916 ft.; B—Mazda Oil Corp. 1 Maggie Lewis, NE NW NW 4-21n-10w, total depth 6,925 ft.; C—Superior Oil Co. 41-2 Farnsworth, NE NE NW 2-21n-10w, total depth 6,908 ft.



BOOKS

A.S.T.M. STANDARDS, 1949. Published by American Society for Testing Materials, 1916 Race Street, Philadelphia. 8,400 pp. $54.

This book is published in six parts, and gives in latest approved form 1,550 standards, specifications, tests, definitions, etc. Part 1 is labeled Ferrous Metals; Part 2, Nonferrous Metals; Part 3, Cement, Concrete, Ceramics, Thermal Insulation, Road and Waterproofing Materials, Soils; Part 4, Paint, Naval Stores, Wood, Adhesives, Shipping Containers, Paper; Part 5, Textiles, Soap, Fuels, Petroleum, Aromatic Hydrocarbons, Water, and Part 6, Electrical Insulation, Plastics, Rubber. Each part of the 1949 book is complete with detailed subject index, two tables of contents, and arranged to provide technologists with as usable a book as possible. To keep the books up to date, a supplement willl be issued to each part late in 1950. Bought separately the parts are priced as follows: Parts 1, 5, 6, $10 each. Parts 2, 3, 4, $8 each.



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New Method for Measuring

SEISMIC VELOCITIES

by Neal J. Smith* and A. P. Claudet†

A new method of measuring seismic velocities of the formations crossed by a bore hole has been tried with partial success. It consists of detonating small charges of explosives, such as that in the firing chamber of a side-wall coring gun or a perforating gun, in a bore hole and recording the explosion impulse with a surface or near-surface geophone.

Introduction

IF the seismic impulse set up by the operation of a side-wall core gun or by a gun perforator could be picked up at the surface by conventional seismograph equipment, the geophysicists would have at their disposal a means of obtaining a large amount of new velocity data at a very modest cost. This possibility was well worth exploring.

Assuming that such signals could be distinguished, one might foresee a condition whereby service companies, operating explosion-motivated core takers or perforating guns, would add to their services the operation of sufficient seismic equipment at the bore-hole site to obtain the uphole seismic travel times related to each charge fired. The amount of rig time involved would be negligible. Theoretically, all that would be needed would be recording equipment for, say, a maximum of four traces with seismometers to match.

It was known that some work had already been done on the problem by others, but the results were not available; therefore, the geophysical division of The California Co. made arrangement with Schlumberger Corp. and American Exploration Co. for a preliminary evaluation of the theory in a California Co. well.

*Area manager, Schlumberger Well Surveying Corp., New Orleans, and †geophysicist, The California Co., New Orleans.

Location of Experimental Test

The drilling well in which the experiment took place is located in Bude field, Franklin County, Mississippi. The well is The California Co. 1 U.S.D.A. 2, located 1,986 ft. south and 1,971 ft. west of NE cor. 19-5n-4e. Fig. 1 is a map showing the exact location of the well.

History and Technique

On March 8, 1950, an electric log was run to total depth of 11,077 ft. in The California Co. 1 U.S.D.A. 2, and the velocity experiment immediately followed, using the same Schlumberger equipment and personnel. J. W. Northrop, geophysicist for The California Co., was in charge of

Fig. 1—Location plat, California Co. 1 U. S. D. A. 2, Bude field, Franklin County, Mississippi.

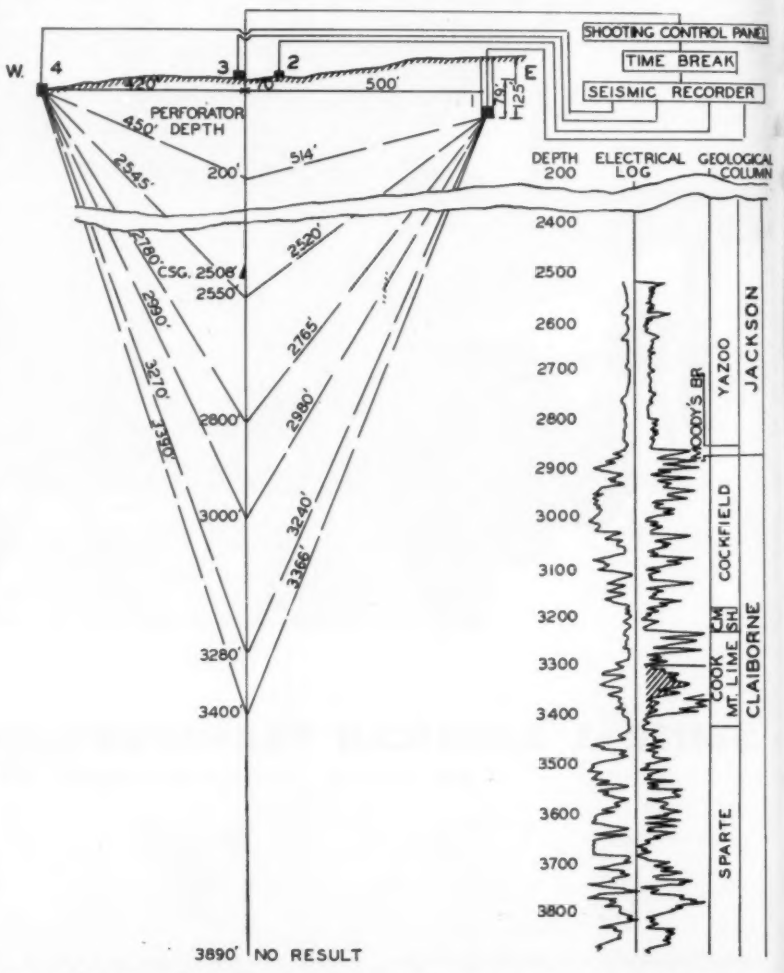

Fig. 2—Experimental velocity survey, California Co. 1 U. S. D. A. 2, Bude field, Mississippi.

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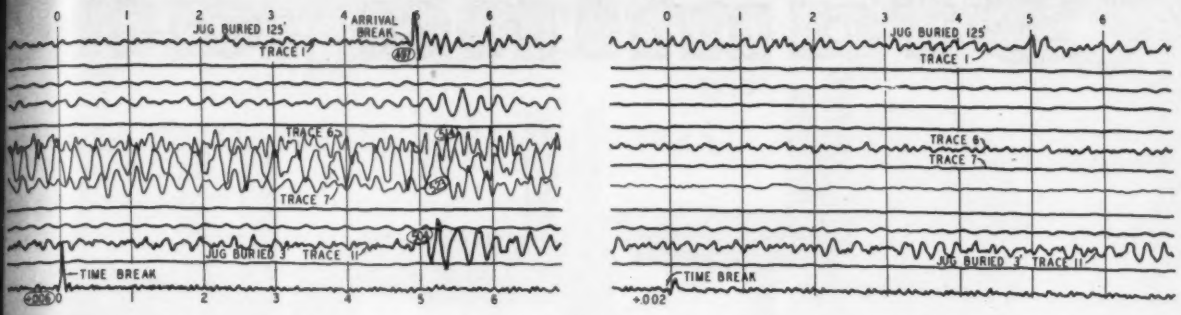

Fig. 3—(Left) Record at 3,400 ft. (D.F.) at base of Cook Mountain lime. Trace one, seismometer buried 125 ft., shows clean signal at 0.497 seconds. Fig. 4—(Right) Record at 3,890 ft. (D.F.) in Sparta. No recognizable signals on any of the four active traces.

STATISTICS

Gun perforator depth in ft. (D.F.)	Seismometer Group 1 Buried 125 ft.—Elevation 434 ft.			Seismometer Group 2		Seismometer Group 3		Seismometer Group 4 Buried 3 ft.—Elevation 351 ft.		
	Hypotenuse distance in feet	Time, seconds	Velocity feet, second	Time, seconds	Velocity feet, second	Time, seconds	Velocity feet, second	Hypotenuse distance in feet	Time, seconds	Velocity feet, second
200	514	.090	5,711	.052	4,100	.039	5,100	450	.085	5,290
2,500	2,520	.400	6,300	No result		No result		2,545	.405	6,280
2,800	2,765	.431	6,430	No result		No result		2,780	No good	....
3,000	2,960	.451	6,560	No result		No result		2,990	No good	....
3,280	3,240	.467?	6,940?	No result		No result		3,270	No good	....
3,400	3,366	.497	6,760	No result		No result		3,390	.504?	6,700
3,890	No result	....	....	No result		No result		3,870	No good	....
3,890	No result	....	....	No result		No result		No result	....	....
4,310	No result	....	....	No result		No result		No result	....	....
3,865	No result*	....	....	No result		No result		No result*	....	....
3,400	No result*	....	....	No result		No result		No result*	....	....

*Schlumberger generator group running.

the general program, ably assisted by H. D. Fox, development geologist for The California Co.; Brown and Palmer of American Exploration Co.; and Kokesh and Hartsell of Schlumberger. Details of the circuit hookup had previously been discussed by A. P. Claudet of Schlumberger and R. W. Upshaw, American Exploration supervisor.

A schematic presentation of the field layout is shown in Fig. 2, and can be summarized as follows:

The side-wall coring gun, or gun perforator, was lowered at the end of the logging cable in the bore hole of the well to the depth at which the explosive contained in the gun chamber was to be detonated.

The logging cable was connected to the shooting control panel, which in turn was connected through time break equipment, to the seismic recording equipment. The Schlumberger circuit used through the shooting control panel was that ordinarily used for placement of radioactive markers, the break registering on trace No. 13 of the seismic record. The operating compartments of the seismic recording truck and the logging truck were linked by telephone.

Position of the seismometers:

Seismometer Group 1.—One seismometer encased in an aluminum torpedo was lowered to the bottom of a cased shot hole having a surface elevation of 434 ft. and a total depth of 125 ft. The surface location of the shot hole was approximately 500 ft. east of the well site. The seismometer elevation when resting at the bottom of the hole was 309 ft. The instrument was connected to feed No. 1 trace.

Seismometer Group 2.—Four grouped seismometers located on the surface of the ground about 70 ft. from the well site were connected to feed the No. 6 trace.

Seismometer Group 3.—Four grouped seismometers located on the surface of the ground, adjacent to the well were connected to feed No. 7 trace.

Seismometer Group 4.—One seismometer located 420 ft. west of the well was placed at the bottom of a hand-dug hole 3 ft. in depth and connected to feed No. 11 trace. The surface elevation here was 351 ft., hence the effective seismometer elevation was 348 ft.

Field Operation and Results

Immediately upon completion of the electrical log of the well, side-wall coring was carried out in the usual manner at points selected by the geologist within the Eutaw-Tuscaloosa section (10,000-11,077 ft.). Since no seismic signals were picked up from these depths, the remaining coring bullets were fired at the bottom, middle, and top of a shale member just below the 10¾-in. casing string at 2,508 ft. No signal was picked up even at these comparatively shallow depths, and it was concluded that the charge of 3 g. of gunpowder per

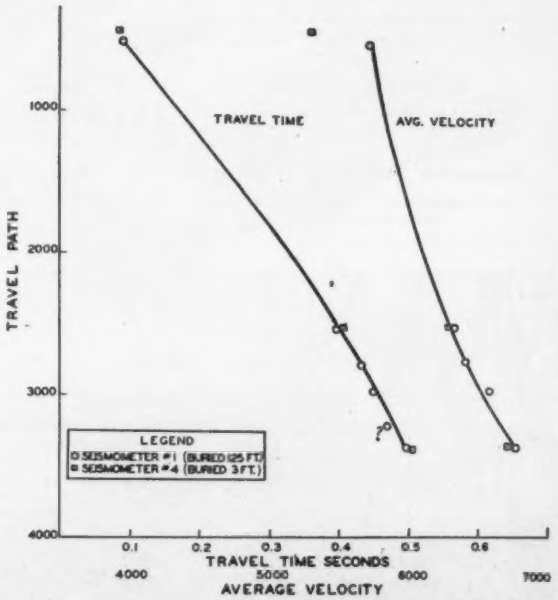

Fig. 5—Experimental velocity survey, California Co. 1 U. S. D. A. 2, Bude field, Mississippi.

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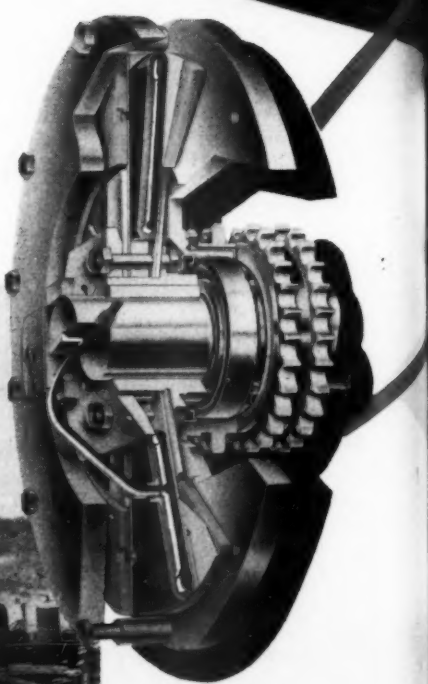

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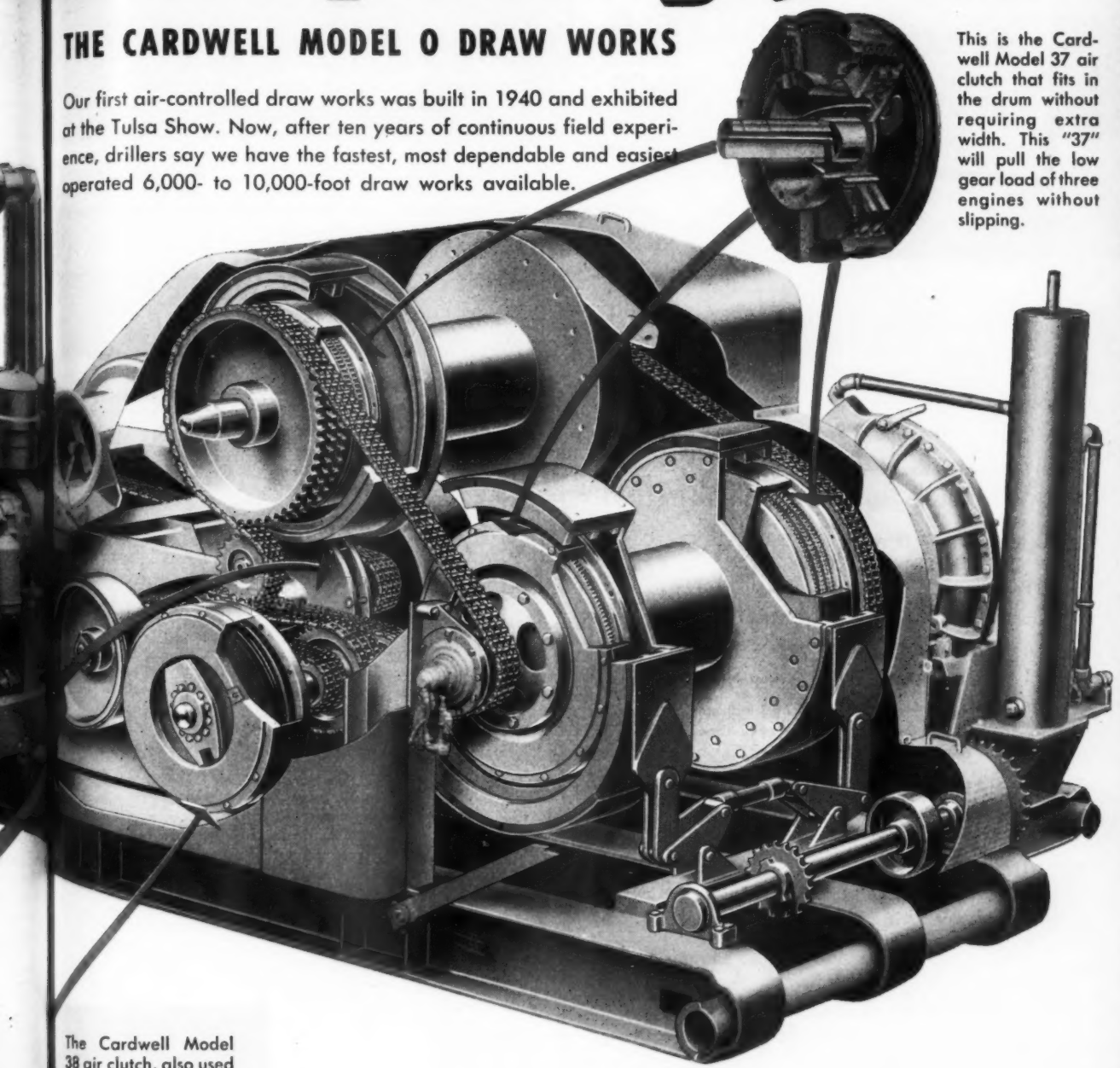

The Cardwell Model 38 air clutch, also used on the pump and rotary table drives . . . is already famous for NO FAILURE, NO ADJUSTMENT AND LONG LIFE WITHOUT REPAIRS.

Note the H-Beam foundation, the compact engine power take-off, the availability of sand line drum and hydromatic brake. The drum chain assembly and cathead shaft may be idle while the rotary table is operating, thereby reducing wear. The Cardwell "Air-Flex" clutches are field proved on 30 rigs without a single failure. The Cardwell "Air Disc" drum clutches have been used in the Model O and Cardwell "Trailerig" since 1947. These are the only friction clutches available that can be mounted in the drum without increasing the rig width, and still provide lowest line pull without slipping. Every wearing part of every assembly in this rig is heat-treated to give maximum service life. That's why Cardwell rigs are known throughout the world as "Tough Iron."

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Bit Size: 8¼"
Spacings: AM = 10"
AO = 24'
Limestone = 32"

LOG ANALYSIS

1) Water Saturation S

R_o is unknown. Interpretation follows pattern outlined in Example No. 9 of this series.
R_i = 72 ohms — 10" Normal corrected
R_t = 72 ohms — 24' Lateral corrected
SP = –100 mv.

At Level A: $\frac{R_i}{R_t} = \frac{72}{72} = 1$

S = 15% — See chart below

2) Formation Water Resistivity R_w

$SP = -90 \log_{10} \frac{R_m}{R_w} = -100$ mv.

$R_w = \frac{0.45}{13} = 0.035$ ohmmeter at BHT

3) Porosity p

$R_t = \frac{F \times R_w}{S^2}$; $F = \frac{72 \times 0.15^2}{0.035} = 46$

$p = \sqrt[m]{\frac{1}{F}} = 16.0\%$ m = 2.1

4) "MicroLog"* — The "MicroLog" indicates the permeable porous zones very precisely.

CORE ANALYSIS (at Level A)

Average Porosity: 15.6%
Water Saturation: 16.6%

PRODUCTION RESULTS

Perforated:	6800' to 6836'
Initial Production	698 BOPD, 43.4° API
Gas/Oil Ratio	673/1

*"MicroLog" is a trade mark of the Schlumberger Well Surveying Corp.

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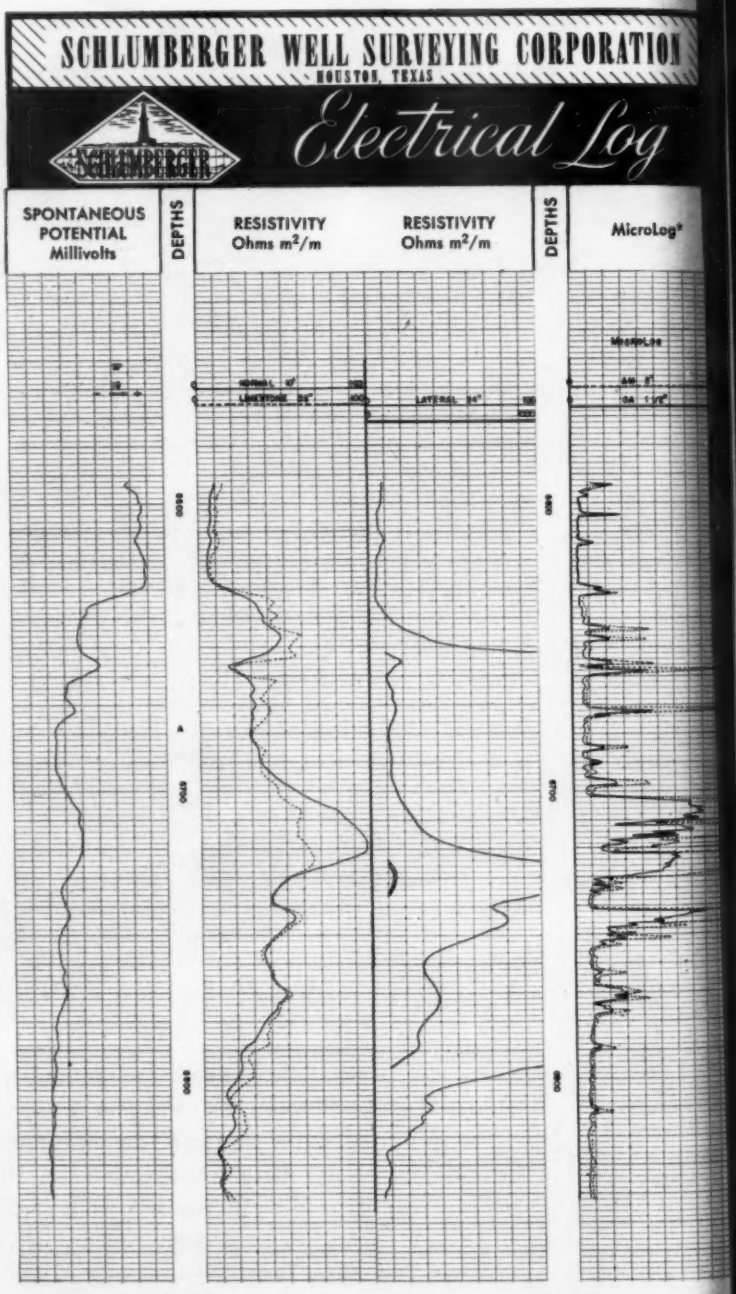
HOUSTON



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chamber did not furnish enough energy to register at the surface.

Next a perforating gun was used; it was loaded with five dummy bullets per block of eight so as to provide as much separation as possible between shots. The powder charge in each chamber of the perforator was 24 g. as compared with 3 g. in the chamber of the side-wall gun. The same hookup was used.

In order to keep the number of shots at a minimum, the procedure with the perforator was to work from top down, although in each case in order to insure accurate depth, the gun was lowered a few feet below the point selected and then brought back up. One shot (200 ft.) was made within the casing. All other shots were fired below the casing in the open hole.

In spite of the relatively high powder charge in the perforator chamber, it was necessary to shut down all rig machinery, as well as the Schlumberger electrical generator, in order to cut down the surface noise level sufficiently to allow the seismic equipment to operate at high gain. The ability of the seismometers to pick up the shock set up by the perforator was in direct proportion to their freedom from surface noises.

The results obtained are as follows:

Seismometer Group 1.—The best results were from the one seismometer located at the bottom of the 125-ft. shot hole. Clear signals were received from depths as great as 3,400 ft.

Seismometer Group 2.—Practically no results; recognizable signals received only from shallowest shot. Surface noise affected the reception so much that it interfered with proper reading.

Seismometer Group 3.—Practically no results; recognizable signals received only from shallowest shot. Effect of surface noise was much too great, possibly too close to derrick.

Seismometer Group 4.—This seismometer, 420 ft. out and buried 3 ft., gave usable data down to 2,550 ft. (D.F.), with a questionable reading at 3,400 ft.

Comparison between Seismometers 1 and 2 should be tempered by the realization that they are horizontally 920 ft. apart and on different types of terrain. No. 1 was located on a rise, No. 4 in a wooded creek bottom next to a small stream. Moreover, Seismometer 4, as well as the two groups 2 and 3 near the well site, had to receive signals through an undetermined amount of low velocity material, i.e., weathering, whereas Seismometer 1 was located below the low velocity layer and was unaffected by such material.

Briefly, clear signals were recorded by the deeply buried seismometer down to 3,400 ft. (D.F.), which represent the base of the Cook Mountain lime. Shots in the Sparta (3,890 ft. D.F.), and near the base of the Cane

(Continued on page 124)

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XUM

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

This department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in various phases of plant operation, as well as those connected with the marketing and utilization of petroleum products. Readers are invited to submit their problems to W. L. Nelson, technical editor. Inquiries must be signed, but only the initials will be printed.

Diesel-Fuel Yields

How can we judge the diesel-fuel yields of our crude oil? We can only make a small amount and how can we get more? F. R. P.

The amount of diesel-fuel oil that can be made from most crude oils is small, usually only 10-15 per cent. The full range of diesel fuel oil from 400° to 700° F. can only be made from those particular crude oils or diesel-fuel fractions which have a characterization factor of 11.55-11.65. Such crude oils are somewhat scarce, mainly certain crude oils from the Gulf Coast area, California, or Venezuela.

TABLE 1—APPROXIMATE BOILING RANGES AND YIELDS OF DIESEL FUELS POSSIBLE FROM VARIOUS CRUDE OILS

Characterization factor	400°-700° F. range		50 plus D.I., zero pour diesel fuels		
	Diesel index	Pour point, °F.	Boiling range approximate	Pour approximate	Approx. relative yield
12.0	70	50	400-550	zero	35
11.9	65	35	400-600	zero	55
11.8	60	20	400-650	zero	80
11.7	55	10	400-675	zero	92
11.6	50	zero	400-700	zero	100
11.5	45	—10	400-600	—30	55
11.4	40	—25	400-500	low	20
11.3	30	—50	.....	.....	...

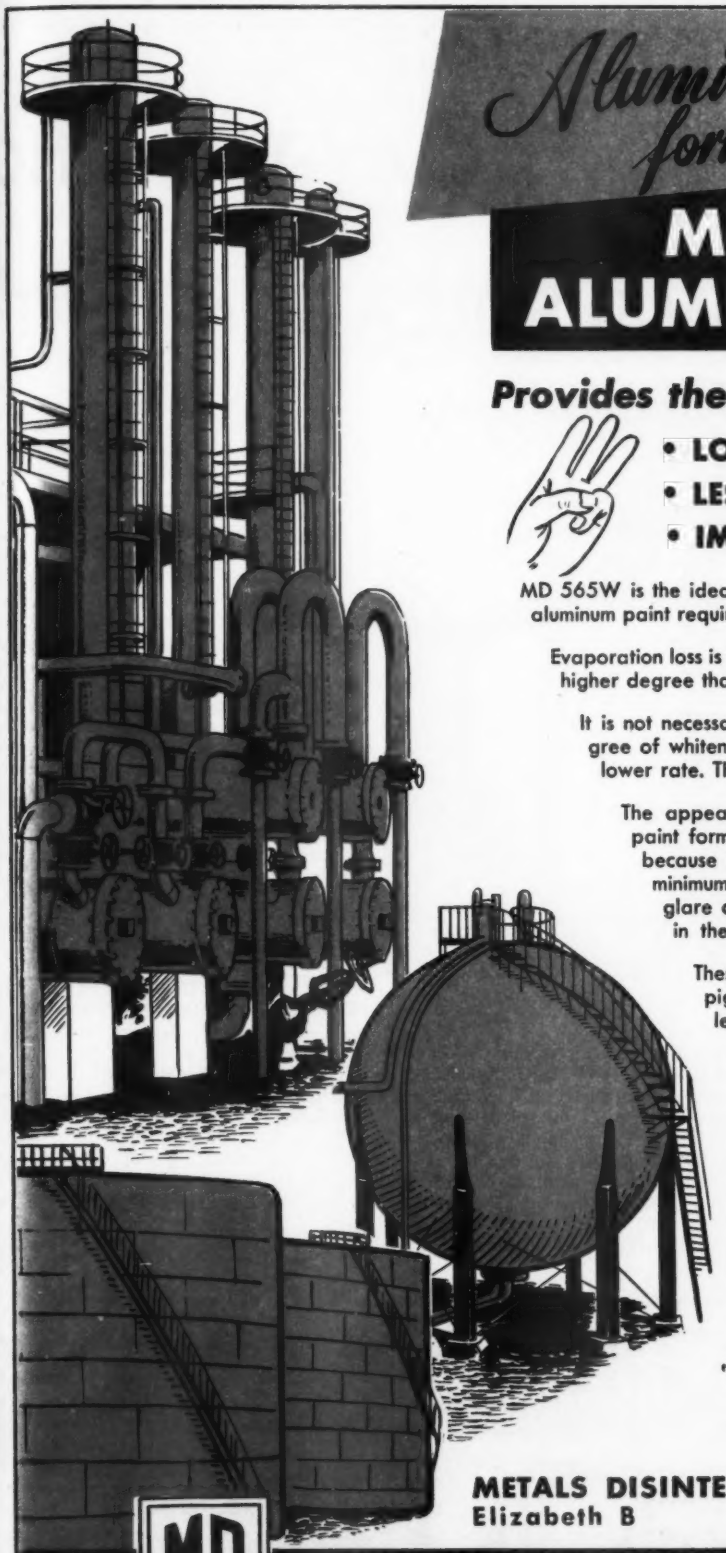
TABLE 2—CHARACTERIZATION FACTORS OF WELL-KNOWN CRUDE OILS

C.F.	Name of crude oil	Typical fields
12.0	Paraffinic mixed base: low-octane gasoline, excellent kerosine, excellent viscosity-index lubes	Cement, Oklahoma; W. Edmond, Oklahoma; Oklahoma City, Oklahoma; Barnhart, Texas.
11.9	Mixed or intermediate base	Centralia, Illinois; Burnet, Kansas; Ray, Kansas; Bayou Island, Louisiana; Healdton, Oklahoma; Seminole, Oklahoma; Quitman, Texas; Grass Creek, Wyoming; Salt Creek, Wyoming.
11.8	Intermediate base: fair gasoline, good kerosine, fair diesel fuel and lube oils	Midway, Arkansas; Belridge N., California; Rangely, Colorado; West Bay, Louisiana; Cut Bank, Montana; Glen Pool, Oklahoma; East Texas, Texas.
11.7	Intermediate base	Dominquez, California; Jocalitos, California; Aransas Pass, Texas; Keystone, Texas; McElroy, Texas; Seminole, Texas; Wasson, Texas.
11.6	Naphthenic mixed base, good gasoline, excellent diesel fuel	Coyote, W, California; Mountainview, California; Raisin City, California; Arrowhead, New Mexico; Hobbs, New Mexico; Fruhrman-Mascho, Texas; Iatan E. Howard, Texas; Kermit, Texas; Slaughter, Texas.
11.5	Naphthenic mixed base: excellent gasoline, good diesel fuel, good low-pour lubes	Capitan, California; Coyote, E. California; Huntington Beach, California; Torrance-Hermosa, California; Monument, New Mexico; Howard-Glasscock, Texas; McCamey, Texas; Amelia, Texas; Hendrick, Texas.
11.4	Naphthene base	Buena Vista Hills, California; Inglewood, California; Santa Maria-Orcutt, California; Lolita, Texas; Smackover, Arkansas; Clear Lake, Texas; High Island, Texas.
11.3	Naphthene or asphalt base: excellent gasoline, good cracking stock, excellent asphalt	Edison, California; Elk Hills, California; Mount Poso, California; Round Mountain, California; Torrance, California; Iberia, Louisiana; Heyser, Texas; Refugio, Texas; Saxet (shallow), Texas; Withers, Texas.

Crude oils of higher characterization factor have a good cetane number (or diesel index) but the pour point is too high, whereas crude oils of a lower characterization factor have a low pour point but the diesel index is too low for first-class diesel fuels. The characterization factor (the cube root of the °F. absolute boiling point, divided by the specific gravity) of various crude oils has been discussed in several recent issues of The Oil and Gas Journal, namely "Character of Crude Oils," March 9, 1950, p. 94; "Character or Base of Crude Oils . . ," March 23, 1950, p. 348; and "Intermediate-Base Crude Oils," May 4, 1950, p. 147.

The very best diesel-fuel crude oils are those that contain a 400°-700° F. fraction that has a pour point of 10° F. or lower and a diesel index of 50 or higher. These are the crude oils or diesel fractions that have a characterization factor of 11.55-11.65 (a correlation index by the Bureau of Mines Hempel distillation of about 43-48). Higher-characterization-factor crude oils have too high pour points and thus the end point or yield must be reduced by lowering the cut point to 675°, 637°, or 600° F. This reduces the yield to approximately 90, 70, and 55 per cent of the full yield of diesel fuel. Likewise, lower-characterization factors than 11.6 produces stocks that have low pour points but poor or low-diesel indexes. Nothing much can be done with such crude oils because increases in the boiling range tend to further reduce the diesel index. Thus, the boiling ranges of diesel fuels that can be produced from various kinds of crude oils are somewhat as indicated in Table 1. A lower end point reduces the pour point and slightly increases the diesel index. Increasing the initial boiling point decreases the diesel index by a small amount.

Characterization factor is not widely understood as a means of describing crude oils, and hence the identifications shown in Table 2 may be helpful.



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The appearance of equipment painted with aluminum paint formulated with MD 565W is greatly improved, because it produces a whiter, brighter finish with a minimum of highlighting and spotty glare. Its non-glare characteristics are particularly advantageous in the painting of large surfaces, such as tanks.

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Union Oil Co. of California Operates

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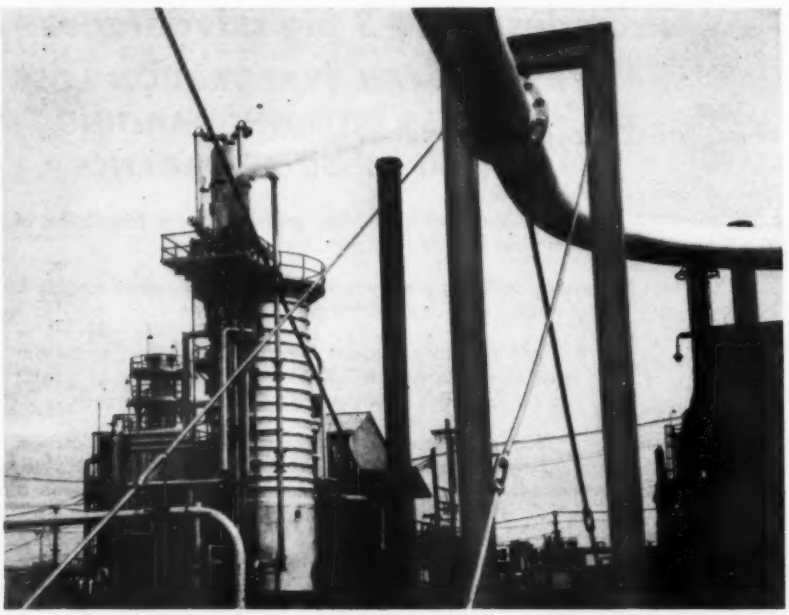


Filtrol fractionation unit at Union's Oleum, Calif., refinery.

WHEN Union Oil Co. of California set up program to modernize its entire Oleum, Calif., refinery, particular attention was given to the facilities designed to produce its Triton motor oils. Various units have been changed in operating technique, while others have been newly built from the ground up to improve the overall processing.

One of the units changed and broadened in scope was built originally for vacuum distillation of a long residuum produced from selected crudes exceptionally high in paraffinic fractions. Former operation of this unit resulted in waxy lubricating-oil distillates and low-penetration asphalt bottoms, but no provisions were immediately available to recover the high-viscosity motor oil, or bright stock, which, therefore was included in the asphalt bottoms.

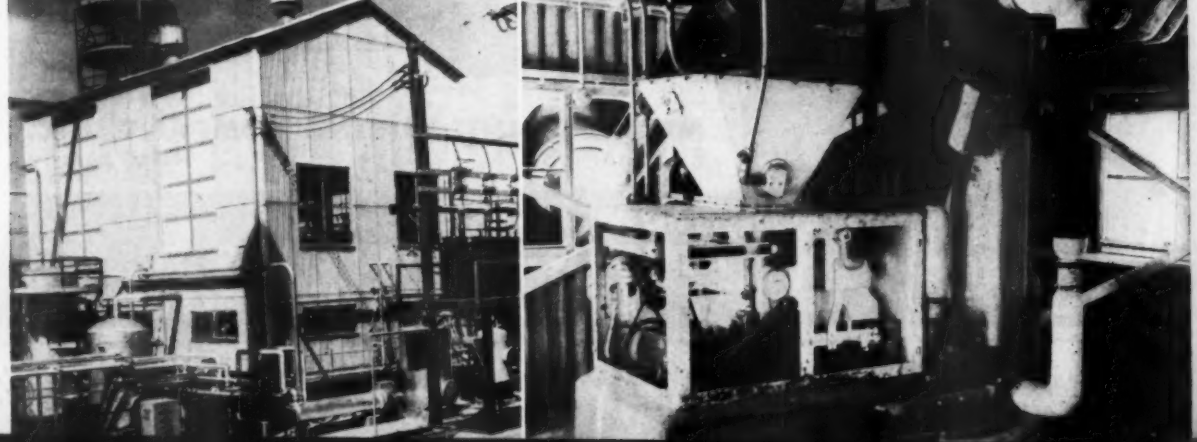
The long residuum, produced as in former refining operations, is processed in a newly built Duo-Sol plant, where the asphalt is separated, to yield a broad raffinate containing material for various S.A.E. grades of Triton motor oil, plus bright stock. After Duo-Sol treating, the broad-cut raffinate is then processed in an improved propane refrigeration and dewaxing plant having continuous rotary filters to separate the wax from the lubricating-oil stock. The crude wax is further processed to various grades of paraffin. The dewaxed broad raffinate is sent to the newly redesigned vacuum unit which incorporates facilities for clay treating.

The combination clay-treating and vacuum distillation unit is designed to handle various other products in addition to clay treating Triton motor oils. The flexibility of the unit is indicated by the following separate operations:

1. Filtrol fractionation of dewaxed Duo-Sol raffinate into Triton motor-oil base stocks.
2. Filtrol fractionation of a broad phenol raffinate into Aristo motor oils, or, clay treating of individual phenol raffinates to produce Aristo motor oils.
3. Clay treating of acid-treated spray oil raffinates.
4. Clay contacting of Aristo turbine oils.

It is also possible to operate the

Left: This building contains the contacting and filtration equipment. Right: Clay feeding unit, with dust separator.



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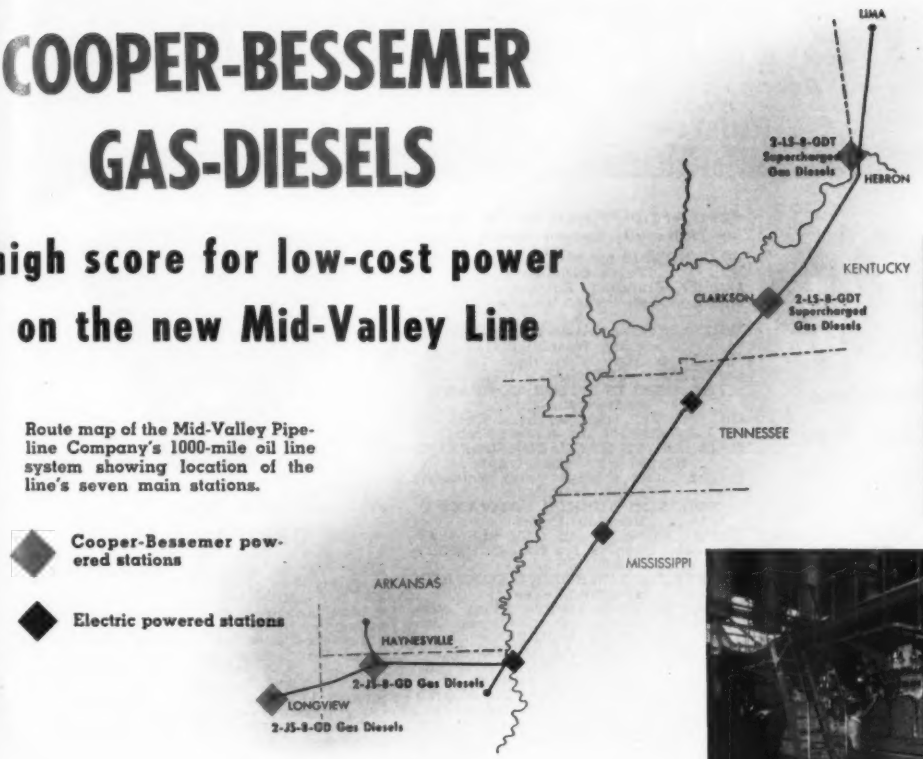
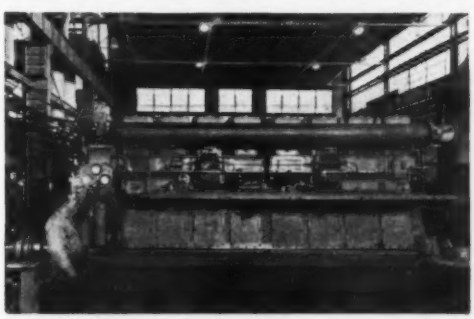


Route map of the Mid-Valley Pipeline Company's 1000-mile oil line system showing location of the line's seven main stations.

Another Example of Efficient Power at Lower Cost

B. F. Relf of Mid-Valley checking a supercharged LS-8 gas-diesel, rated 1715 hp at 327 rpm on the Cooper-Bessemer erection floor. Mid-Valley's Clarkson and Hebron stations in Kentucky will each be powered by two of these modern engines.



C. N. Brindley of Mid-Valley checking a JS-8 gas-diesel, rated 800 hp at 450 rpm on the Cooper-Bessemer erection floor. Units of this type will power Mid-Valley's Longview, Texas, and Haynesville, La., stations—two engines for each station.

WHEN put into operation this Fall, Mid-Valley will be the most modern, most economical of the nation's cross-country oil lines. Highly significant, thorough studies proved that a combination of four gas-diesel powered stations and three electric powered stations assured peak economy. Modern, exceptionally efficient Cooper-Bessemer gas-diesels were picked for the job, will be located as shown on the map.

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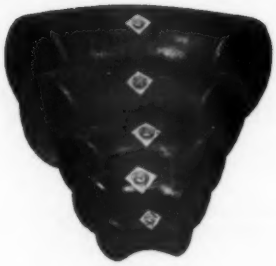

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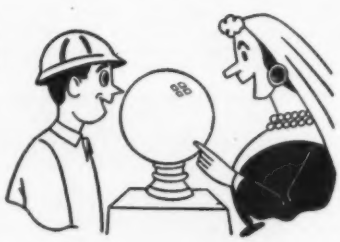

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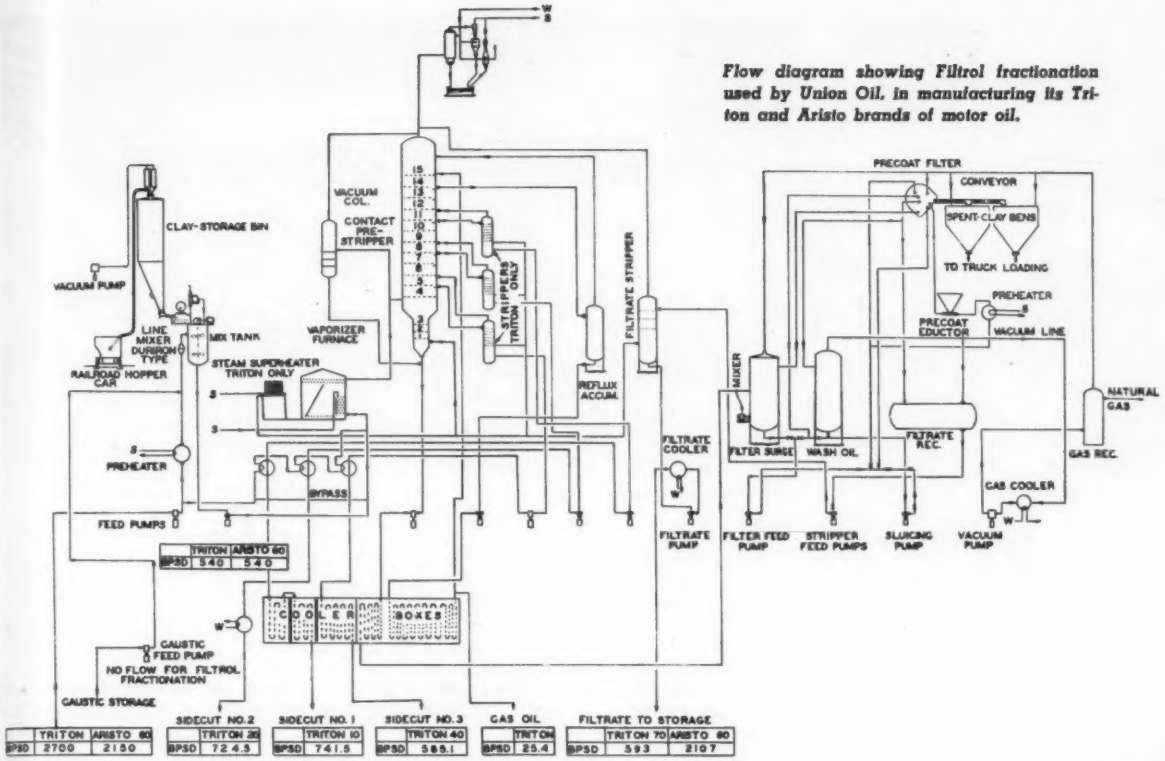


Flow diagram showing Filtrol fractionation used by Union Oil, in manufacturing its Triton and Aristo brands of motor oil.

unit as a straight vacuum distillation unit, without using any of the clay facilities.

When producing Triton motor-oil base stock, the Duo-Sol treated, propane-dewaxed raffinate from feed tanks is pumped into a manifold arranged for splitting the feed into two unequal parts. Flow-recording controllers govern the quantity of incoming stock, and another flow-recording controller governs the split streams to the unit. The split is in the ratio of 20 and 80 per cent respectively.

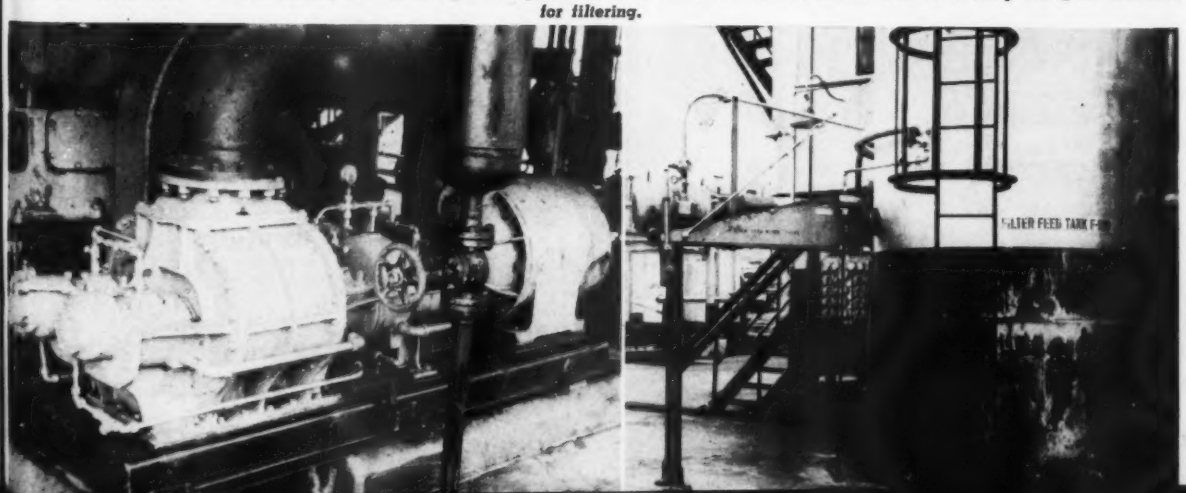
The 20 per cent split travels through a steam-heated interchanger to obtain a temperature of approximately 180° F. with 135-psig. saturated steam. The 80 per cent split is also exchanger heated with side-cut product to about 300° F. and then it is joined by the smaller stream in which clays are mixed.

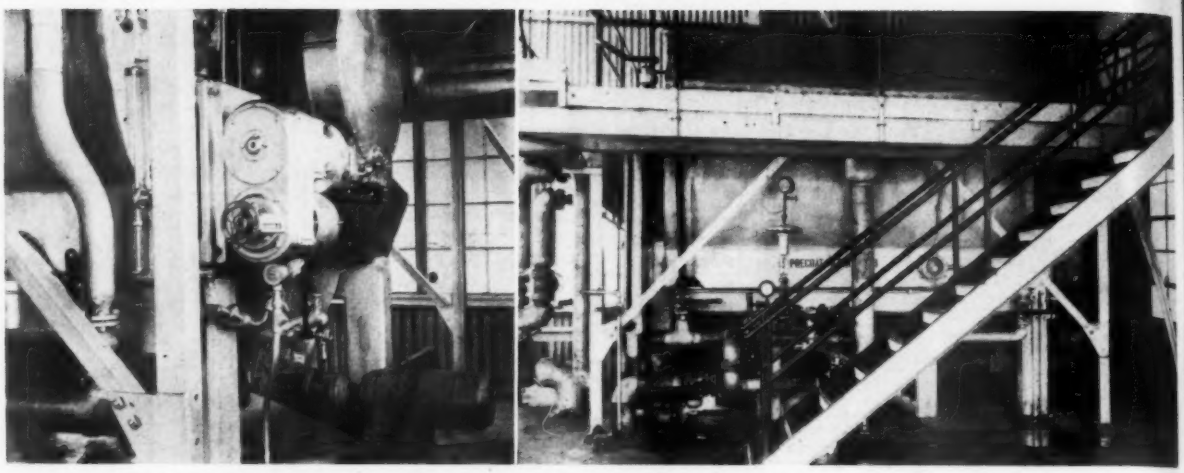
The clays employed to treat the broad-cut raffinate are various, but with Triton production, Filtrol Cat-Lube clay is employed. This clay is shipped to the refinery in railroad hopper cars which are unloaded directly into clay storage by a vacuum suction hose system. In this operation the pump which takes suction on the unloading hose discharges into an Airveyor system bag filter, to separate the clay from the air stream. Only clean air enters the vacuum pump. The clay-storage bin is 15 ft. by 24 ft. high, built so the clay will feed directly into the mixing equipment without further handling.

The 20 per cent split from the unit feed pumps enters a clay-mixing tank, 42 in. by 6 ft., 6 in. high, equipped with a propeller-type electric-driven mixer, or agitator. Clay is added by an Omega gravimetric feeder which automatically delivers a predetermined quantity. Positive feed is provided by a screw conveyor from the clay bin to the hopper of the feeder. Holdups due to packed clay are eliminated with a Syntron vibrator so that a constant feed is assured under controlled conditions.

Since the clays are finely ground, fine dust arises from the screw-conveyor outlet and from the gravimetric feeder. This dust is collected by a Rotaclone unit which is a combination air blower and centrifugal separator containing a small hopper into which the recovered material is de-

Left: Electrically driven blower in filtrol fractionation plant. Right: Filter feed tank, with outside-mounted mixer to keep slurry in condition for filtering.





Left: Power end of filter at Union Oil's Oleum refinery. Right: Precoat filter in second story of process building.

posited and subsequently returned to the clay-mixing tank. Air withdrawn from the system by the Rotaclone unit is discharged to atmosphere through a small variable-size orifice.

The mixture of clay and the 20 per cent split of the broad dewaxed Duo-Sol raffinate is pumped from the clay-mixing tank to a point where it joins the 80 per cent split. Result is a homogeneous slurry which is run to a heater. This heater is automatically fired.

Steam at a rate of 1,080 lb. per hour is introduced into the feed stream at the heater inlet. The transfer line from the heater carries the material to the vacuum column under a temperature of 665° F.

The vacuum column is 13 ft. 6 in. in diameter and contains 12 fractionating trays in its main section, and 3 stripper trays in its base. The trays are numbered from bottom to top beginning with the bottom stripping trays. The feed enters the column at its third tray, and superheated steam at a rate of 3,880 lb. per hour is introduced into the base of the column. Vacuum is produced in the column with a barometric condenser and two steam ejectors which maintain 25 mm. Hg in the top of the tower.

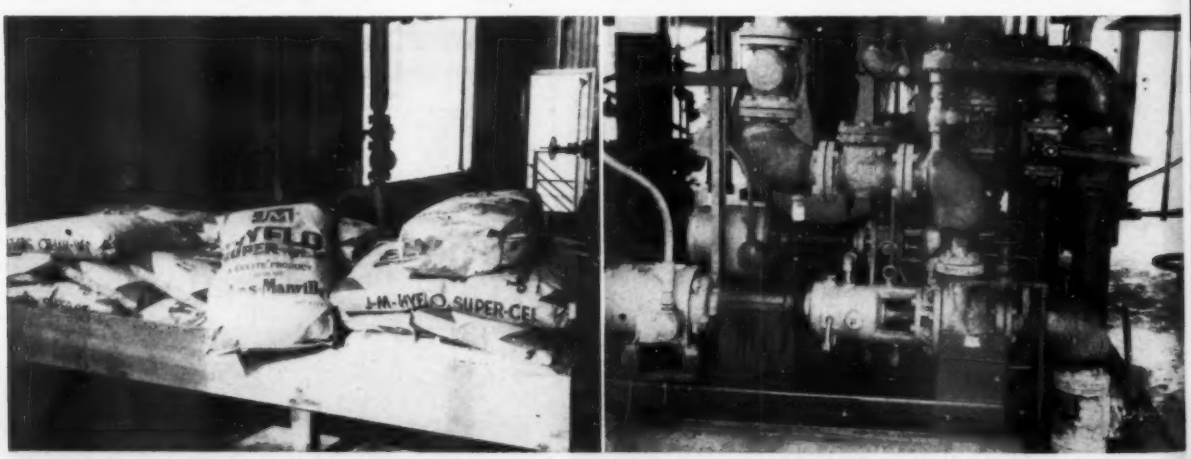
With a charge of 2,700 bbl. per day to the vacuum column, a top cut, amounting to approximately 25 bbl. per day of gas oil, is removed from the fourteenth tray. This material flows into a reflux accumulator and is pumped through coolers to reduce its temperature to 150° F. The gas oil is employed for column reflux and is recirculated at a rate of 163 g.p.m., while excess material flows to storage.

Design of System

The system is designed for either a three-side-cut operation or with only two side streams. Normal operation includes three side cuts, an overhead gas oil, and a bright-stock bottoms. The first side cut, Triton S.A.E. 10 base stock, is withdrawn from tray 11. This stream flows to a stripping column, by level control from the vacuum column. The stripping column is 4 ft. in diameter by 15 ft. tall and contains seven stripping trays. Superheated stripping steam is introduced below the bottom tray at a rate of 340 lb. per hour, and steam and stripped vapors return to the main column above the product-draw-off pan. The material in the base of the stripper is pumped through interchangers, to heat the incoming feed to the main column. The stream is then cooled and sent to storage as finished motor-oil base stock.

The next cut is withdrawn from the main column at tray 8, and enters a side stripper similar in size to the column employed on the top lube-oil cut. This tower, however, has only six trays, and 340 lb. per hour of 500° superheated steam is introduced below the bottom plate. Steam and vapors are returned to the main column above the point of drawoff.

The third steam is removed from the main column from tray 5 in the main column and enters a stripper of the same size as that employed for the second cut. Superheated steam at a rate of 270 lb. per hour is admitted in the base of this stripper. Vapor and steam leave the column and return to the vacuum tower above the point of withdrawal. Both number 2 and 3 cuts are pumped from the strippers by separate pumps and through separate lines to interchangers, to heat the feed to the unit, then through



Left: Dock in filter room with bags of clay used to precoat filter. Right: Pumps on ground floor of filtrol fractionation plant at Oleum, Calif.

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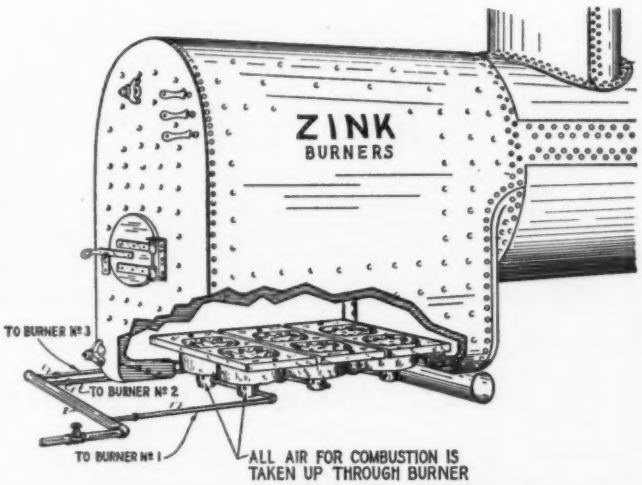

Shows typical installation of John Zink Vertical Bi-Mix Burners in locomotive type boilers.

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JOHN ZINK COMPANY

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XUM

coolers as finished Triton base stock motor oils.

Bottoms from the vacuum column contain all of the clay originally introduced into the 20 per cent split stream at the beginning of operations. They are the bright stock, or 70 S.A.E. high-viscosity motor oils originally included in the asphalt bottoms. The bottoms are pumped to coolers to reduce the temperature to 425° F., and then flow to a feed surge tank ahead of the filter. The filter surge tank is 7 ft. by 16 ft., equipped with a propeller-type mixer.

The next step in processing bright stock is by filtration through an Oliver precoat unit having an outer steel housing 9 ft. i.d. by 11 ft. long. The rotating drum inside the housing or shell is 8 ft. by 10 ft. and is mounted on trunnion bearings equipped with stuffing boxes to prevent leakage.

The drum is driven by a 3-hp. electric motor and a variable speed controller, producing speeds ranging from 0.70 to 0.14 r.p.m. The drum's periphery is divided into 20 equal sections with a collector pipe for each section, all of which join at a common outlet for disposition of the filtrate. The frame of the drum is covered with a layer of coarse wire screen to support a finely woven wire cloth to receive the layer of precoat clay.

Precoating the drum of the filter requires approximately 1,500 lb. of special clay to form a layer 3 in. thick on the 250 sq. ft. of surface on the wire supporting cloth. The precoat is a slurry mixture of 11 to 15 lb. of Johns-Manville Hyflow Super-Cel clay to each 100 gal. of oil, which is deposited on the drum. Mixing of the clay with the oil is accomplished in a precoat eductor, into which the clay is dumped manually from bags. A Syntron vibrator keeps a steady stream of clay flowing into the oil and the resulting slurry is produced by natural turbulence.

TABLE 1—TRITON OPERATION—FILTROL FRACTIONATION

Feed (composition)—	Lb./hr.	°A.P.I.	B/SD
Dewaxed Duo-Sol raffinate	34,850	28.5	2,700
Filtrol Cat-Lube clay	675	....	....
Products—			
Gas oil	304	34.0	23
Triton 10	9,453	30.4	743
Triton 20	9,290	29.2	723
Triton 40	7,550	28.5	585
Triton 70	7,808	25.5	562
Spent clay	820	....	....
Noncondensables and moisture	300	....	....
Total	35,525	28.5	*2,669

*Nineteen barrels of oil are lost to clay saturation and 12 bbl. as noncondensables.

Producing filtrate from the vacuum column begins as soon as the precoat is completed, and continues until the precoat has been cut down to approximately ¼ in. thick. The hot slurry of bottoms and clay is fed to the vat of the filter while the drum revolves to pick up the clay and the oil. Reduced pressure inside the filter case, produced by circulating refinery fuel gas in the case, draws the oil through the precoat filtering cover of the drum.

As the treating clay originally introduced with the oil in the distillation section is of no further use, it must be removed from the surface of the precoat on the drum. A moving knife edge, geared to travel inward at a slow rate, continuously shaves off the deposit of solid contacting clay and a minute section of the filtering medium, the special clay precoat on the drum. Adjustment of the moving knife edge has a wide limit and can be changed quickly to cut from 0.001 in. at each revolution, or more as necessary. The function of the removal of surface filtering medium is to produce a clean, new surface to pass the filtrate.

Operation of the unit to produce Union Oil Co.'s Aristo motor oils from a broad phenol raffinate is similar to that employed for Triton production, but with variations in temperature, rates of flow, and the like. Individual clay treating of any of the material for which the unit is designed employs only the clay contacting and precoat filter, except that a prestripper column is employed beside the main vacuum column to undesirable light fractions. Caustic is employed for certain filtering operations, to neutralize any organic acids which may be present in the oils.

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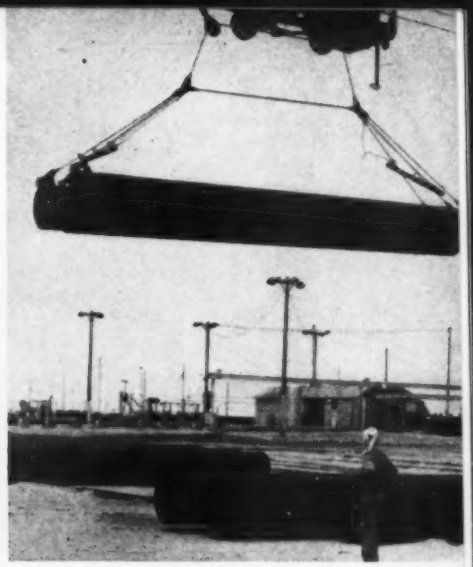


Left: Buffing beveled ends of 31-ft. joints at Ras el Misha'ab prior to automatic welding to form 93-ft. sections. Grit blaster at left has suction nozzles for recovering grit for re-use. Right: Sky hook delivering pipe from a ship 3 miles away to Ras el Misha'ab base.

Tapline Pipe Layers Surmount Problems In Traversing Mountains and Desert

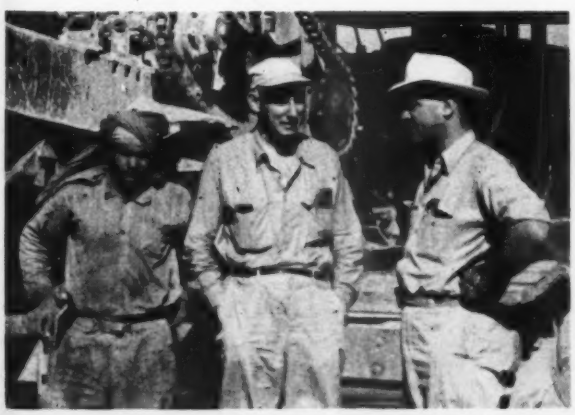
by Paul Reed
Pipe Line Editor

DISTINCTLY different situations have existed for the two contractors, International Bechtel, Inc., and Williams Brothers Overseas Co., in the laying of Trans-Arabian Pipe Line Co.'s 1,068-mile, 30 and 31-in. crude-oil system which will be completely welded by October 1. Consequently each contractor adopted his own solutions and construction techniques.

International Bechtel, Inc., the contractor in the eastern division, has laid pipe continuously during the past 3 years for the 800-mile section across deserts entirely within the politically stable nation of Saudi Arabia. This is probably the longest big-inch pipe job ever completed by a single spread. One spread has been enough because of stoppage of pipe shipments for an entire year in 1948 and 1949 as a result of suspension of United States export permits. When pipe shipments were accelerated during a period of about 3 months this year, Bechtel's single spread was able to lay pipe as rapidly as it was received.

The Arabian desert, where Bechtel has operated, is on the whole good pipe-line country in spite of its desolate nature. Unique construction features were developed for solving problems inherent in the usual situation. These include the sky hook for unloading pipe from ships, triple jointing by a 100 per cent automatic submerged arc-welding process, and the new aboveground restrained line construction to be described later in this article.

Hostilities between Arabs and Jews affected pipe shipments only by increasing deliveries to the Persian Gulf from 45,000 to 60,000 tons during the first 4 months of 1948. Shipments to Beirut, Lebanon, were suspended during the later half of 1949 while Williams Brothers Overseas Co. was reorganizing its construction forces and preparing to resume field work in the 268-mile western division.



JOURNAL'S PIPE-LINE EDITOR GATHERS MATERIAL ON ROUTE OF TAPLINE

Paul Reed, pipe-line editor of The Oil and Gas Journal (center) and Stanley Douglass, engineer of Trans-Arabian Pipe Line Co. (right) with Arab ditching-machine helper at trenching operations west of Badanah, Saudi Arabia. This photograph was taken during the author's trip along the line from the Ras el Misha'ab base to pipe-laying operations in Saudi Arabia, Trans-Jordan, and Syria. This article on pipe-laying practices is the second of four articles on the Tapline project. The Sidon terminal and pump-station equipment will be discussed in early issues.

XUM

A 30-in. joint being "denested" from its position inside a 31-in. joint at Ras el Misha'ab.

In 1948, Williams Brothers Overseas had been forced by hostilities to withdraw entirely. On its return to the Levant in 1949, the Williams Brothers firm was faced with complex problems in the rough country of Trans-Jordan, Syria, and Lebanon. To meet the exacting completion-time schedule, it organized two main-line spreads for pushing the work rapidly across mountains, lava, and basalt country.

Since the only tree within sight of the route is in Trans-Jordan (except on the final approach to the Mediterranean) there has been naturally no clearing of timber or underbrush. No drainage ditches are crossed anywhere. The only two railroad crossings are in Syria.

Along the entire 1,067-mile route the line did not cross a fence or a river. The five streams crossed, which have water the year around, would be regarded as creeks in the United States. All of these are within 30 miles of the Mediterranean Sea. At these crossings no special protection was provided except a cigarette wrap of sheet padding. No vehicular highways were crossed in the 950 miles west of the initial station at Abqaiq.

Prior to construction of the pipe line there were no roads—only a few trails. Tapline built a road parallel to the line for its entire length.

In the lava rock country of Trans-Jordan and Syria, much of the right-of-way has been cleared by hand labor which threw the rocks into a traveling rock crusher. Word went out to "feed the monster and choke him down" but the Arab crew of 60 men found that the machine continued to function no matter how fast they threw the stones into it. Some boulders encountered in ditching were large enough to drill. Many were broken by hand.

Railfall west of the Ante Lebanese Mountains occurs generally between the months of November and April with a drier season from May to October, and averages 25 in. per year. To the eastward the yearly average is scarcely 3 in.

The pipe-laying program has been planned to conform appropriately with deliveries from the United States. During most of 1948 and 1949 laying by Bechtel was slowed down because of pipe shortage. In 1950 pipe has been laid by the combined efforts of both contractors at the rate of more than 60 miles per month.

Pipe shipments have been made in two ways: The 800 miles laid by Bechtel has moved entirely by truck from the Ras-el-Misha'ab disembarking, denesting, and triple-jointing facilities on the Persian Gulf. The 250 miles being laid by Williams Brothers goes from Beirut, Lebanon, by narrow-gage railroad extending into Syria from which it is unloaded at points accessible for truck transportation to the line.

All pipe at Bechtel's east end was laid with 90-ft. joints. At the west end, Williams Brothers spread No. 1 laid 30-ft. joints through mountains; their spread No. 2 in less rugged and considerable level and rolling country has laid pipe in 60 and 90-ft. joints.

The pipe-hauling trucks usually operated in convoys of 4 or 5 each, or in convoys of 15 trucks with 3 leaders. Each American leader carried a veritable mobile machine shop in his truck including spare tires and spare gasoline. Most of the pipe trucks were equipped with a 300-gal. gasoline tank.

Pipe-line construction hauls on the Tapline job have consumed at least the following amounts:

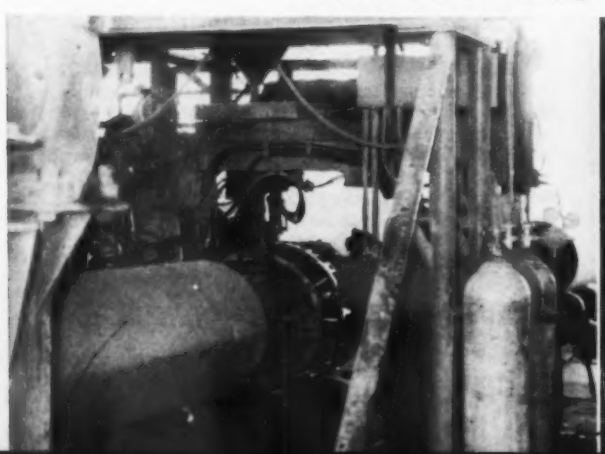
35,000,000	gal. of gasoline
7,000,000	gal. of diesel fuel
600,000	gal. of kerosine
1,000,000	gal. of lubricating oils
2,200,000	lb. of greases
15,000	tons of asphalt

Ditch was dug usually 54 in. deep allowing 24-in. cover. For some short distances it was dug 33 in. deep so that with 2 to 3 in. of cover the pipe was almost flush with the surface. Lineup is done entirely by motor-driven internal line-up clamps.

Welding throughout the project has been done at all spreads with one type of electrode, Fleetweld No. 85; stringer beads have been run with 5/32-in. rods and filler and finish with 3/16-in. Where pipe has been roll welded, a ¼-in. rod was used for the finish bead.

Uniformity of quality of welding has been maintained by identifying changes in welders' habits by means of gamma-ray inspection of approximately 20 per cent of the welds. Films

Left: Water-cooled copper backup ring and lineup clamp seen just before lining up for automatic welding done without manually running a stringer bead. Right: Automatic submerged arc welding while pipe is rotated in special equipment at Ras el Misha'ab for fabricating 31½-ft. joints into 94½-ft. lengths at the Ras el Misha'ab base.



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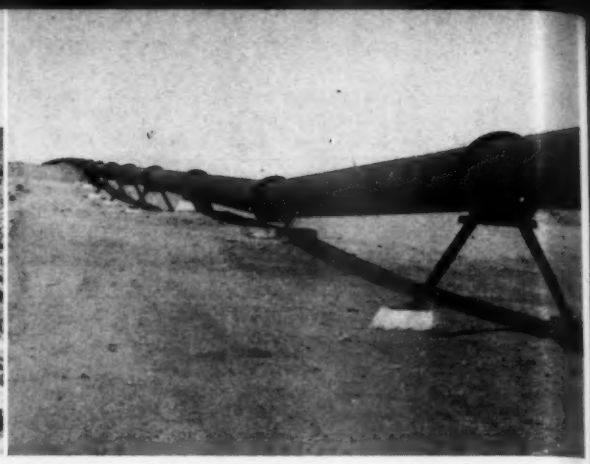


Left: Boom tractors placing 4,000-ft. section of 30-in. pipe on ring-girder supporters. Right: Pipe bolted in ring girders installed so as to provide the straight alignment characteristic of restrained line construction.

are handled by Arabs; interpretation of negatives is done by an American inspector.

Pipe used has run only one-third of 1 per cent in excess of the measured length of the route.

In coating, an effort has been made to maintain a uniform thickness of 3/16 in. In rocky areas and other rough spots where the usual coating with glass fiber and saturated asbestos felt was subject to damage on the bottom and sides, the coating was given an additional reinforcement of strips of fiber mat about 18 in. wide by ½ in. thick bonded with asphalt.

Coating is wrapped with glass mat. A 200-mile stretch of pipe is wrapped with 15-lb. asbestos felt. For 30 miles kraft paper with a flood coat was used. Wrappings were found to be essential for avoiding loss by dripping at the bottom. The protection procedure finally adopted for Tapline buried pipe is as follows: asphalt, glass mat, a second coat of asphalt wrapped with felt.

The corrosive effect of migratory sand dunes has indicated the advisability of protecting pipe in areas where it is likely to be covered by dunes. Dune movement can be an-

SOME OF THE MAJOR ITEMS OF EQUIPMENT ON TAPLINE

	Eastern division	Western division	Total
Tractors	79	68	147
Welding machines	109	128	237
Motor graders	19	6	25
Cranes, backhoes, shovels	42	36	78
Compressors	38	38	76
Light vehicles (sedans, pickups, jeeps)	364	186	550
Trucks—light	72	...	72
Trucks—medium	107	103	210
Trucks—heavy	141	38	179
Buses	8	6	14
Trailers—all types except pipe dollies	119	22	141
Pipe dollies, dual axle	71	49	120
Tankers, semitrailer 2,000 to 7,000 gal.	74	24	98

MAIN LINE PUMP PRESSURES AND PIPE SIZING

Pump station No.	Mile post	Pump discharge pressure (psi.) Initial 6 station program	Later 12 station program	Miles of pipe for different diameters and wall thickness 30″ x 7/32	30″ x 3/8	30″ x 5/16	30″ x ¼	31″ x ¼
1	00	519	621	...	1.14	12.50	37.01	31.29
1a	82.0	...	690	....	0.24	14.83	20.84	41.85
2	159.6	928	863	8.90	16.50	17.20	0.50	24.40
2a	227.5	...	846	....	13.00	15.70	0.83	57.39
3	314.7	779	839	....	15.30	30.00	3.55	39.03
3a	402.8	...	856	....	15.59	14.10	1.17	64.44
4	499.0	789	832	....	33.72	26.52	6.15	23.85
4a	589.0	...	826	....	16.62	14.00	1.00	54.21
5	674.6	898	838	....	13.10	15.30	1.00	22.89
5a	732.0	...	826	4.88	12.81	13.00	2.00	62.67
6	822.0	617	838	....	37.70	14.00	7.20	43.53
6a	924.9	...	895	2.50	34.70	21.60	16.40	63.30
Total miles*				16.28	210.42	208.75	97.65	529.03

*For all pipe sizes including additional terminal, tank, and sea-loading lines, pipe on order for 30 and 31-in. pipe totals 1,084.0 miles.

Left: Details of anchors mounted on concrete blocks. Right: Anchors installed at point of change in direction of pipe line.

ticipated several months in advance. Some experimenting is being done with restraining dune movement by putting oil on the windward side and by splitting dunes with dozers.

No slack loops are used in laying the line in the ditch. The need for these is avoided by making tie-in welds when the pipe is at the mean temperature within the narrow limits prescribed in the specifications. For each section of the line, tie-in temperatures are specified within selected narrow ranges.

In the building of Tapline approximately 50 local Arab contractors employed between 25 and 1,000 men in both eastern and western divisions. These Arab subcontractors handle such operations as application of pipe protection, welding, and various phases of station contracting including specialties such as electric wiring. Pride in workmanship among the Arabs has been developed by ratings based on tests, indicated on identification cards with a photograph of the Arab workman.

The policy of subcontracting work to Arab contractors as developed by Aramco, has been carried even further by Tapline. More than 5,000 Arabs have been engaged in contract work under Arab contractors on the Tapline system.

Camps of both contractors were built of portable units. Bechtel used structures made of plywood with composition roofing. Williams Brothers had aluminum units which could be moved intact with furnishings, lighting, and heating fixtures. Shower and toilet fixtures were included as part of some of these units.

The fast rate at which 90-ft. joints have been laid by Bechtel in open desert country is indicated by records showing that 106 joints have often been handled on a 10-hour working day, not including the hour for traveling to and from the job. Frequently 3 to 3½ km. have been laid. Records were broken when 177 joints were laid in a 10-hour day. It has been found that there is little difference between the time taken for lining up 30, 60, and 90-ft. joints or sections. Bechtel's fastest monthly laying record was 54 miles in August 1949.

Two tractors with the pipe gang have lined up 90-ft. joints. The whole process of lining up and stringer-bead welding has taken about 4 minutes per 90-ft. section. A third tractor sets the pipe on the skids.

Two American spacers beat out the high and low areas at the ends of the pipe. There are three American stringer-bead welders with the pipe gang: two work while one rests.

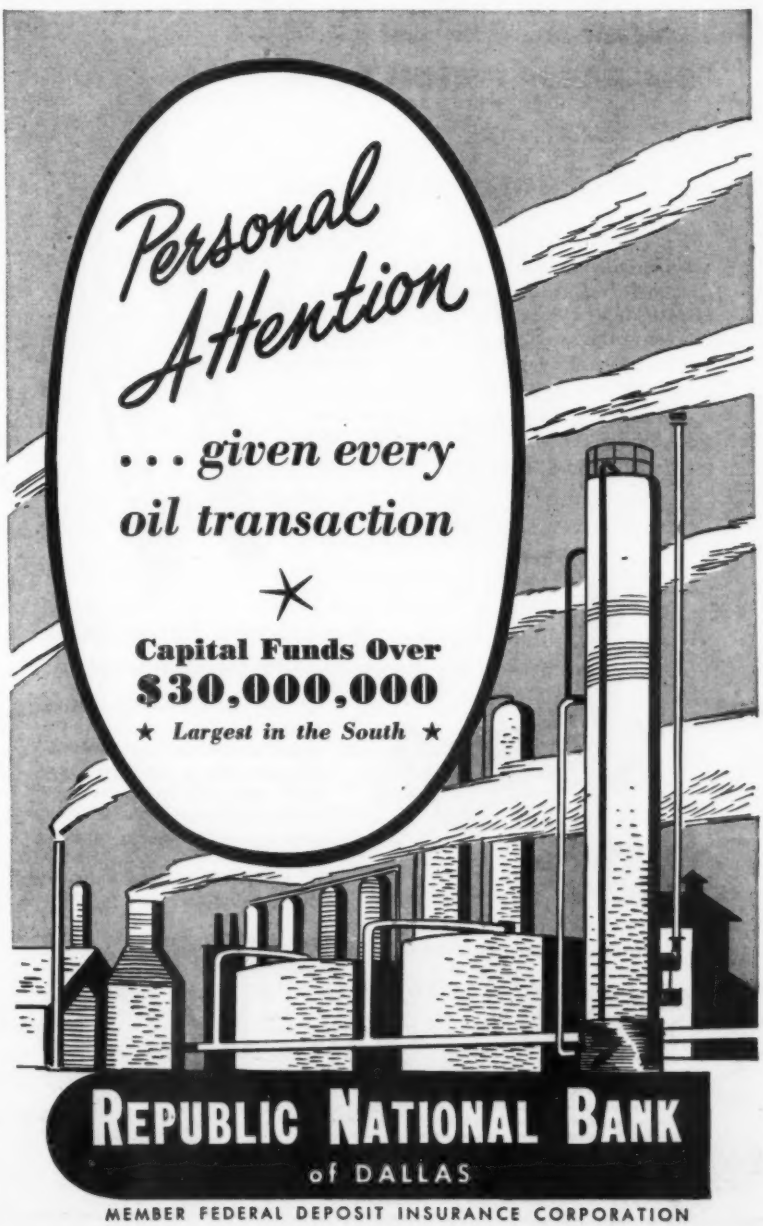
The "flush crew" applying the filler beads has usually consisted of four American and two Arab welders. The "cap crew" applying the finish bead is generally made up of nine Arab welders. Altogether fifteen 300-amp. welding machines have been engaged in these operations. In addition there has been a welding machine with the pickup man who corrected welding marked by the inspector.

Actually top speed was usually not essential for laying pipe at Bechtel's east end of the project because pipe was being generally laid at a faster rate than it was arriving.

Two 30-bbl. dope pots are mounted on each of the high-bed trailers used for transportation to the job. The explanation of mounting these big pots in pairs is that by doing so full advantage is taken of the big trucks. By having two pots together there is less delay.

The Bechtel spread in May 1950 was equipped with two ditchers, a backhoe for digging for restrained line piers, a backhoe for cutting tops of ridges, a backhoe for excavating after shooting, and a dragline also for rock ditches and for wady and river-channel crossings. Bending has been done by a machine applying wrinkle bends.

A marked departure from conventional pipe-line practice is Tapline's development of aboveground restrained line construction so as to avoid expensive blasting and trenching across hard limestone and sandstone. Altogether approximately 40 per cent of the line is supported on short piers by this procedure which has cost about a sixth of protection-and-ditch operations in rocky country. In very soft soil it has been better to bury the pipe because of conditions



which are unfavorable for bearing footing for pipe supports. Two years of Tapline experience has indicated the structural soundness of this aboveground method.

Restrained line construction has only been applied in Saudi Arabia; in Jordan, Syria, and Lebanon all pipe is buried.

For nearly 400 miles Tapline construction is over fairly level terrain which affords an opportunity for aboveground construction of the fully restrained type. "By the fully restrained procedure, there is no provision for movement of the line with temperature. Instead of expanding with temperature rise, the pipe merely loads as a column, and goes into tension rather than contracting, both within the elastic limits of the pipe," according to the statement of the engineers who have devised this method.

"The line is supported on ring girders which are bolted to concrete piers spaced at 20-m. intervals. Beyond certain normal limits where the weight of the pipe and the resistance of the piers to the movement are not sufficient to maintain stability, the line is held in position at points of changes in direction by anchors, the size and design of which vary with the amount of deflection. . . . Construction tolerances are sufficiently broad to permit conducting the work of providing for the restrained line in an assembly-line fashion."

The procedure for restrained line construction proceeds according to the following steps:

1. A surveyor sets center-line hubs at 20-m. intervals along the pipe-line right-of-way.

2. A second surveyor takes level on the center line. Surveyor's field notes go to the field office where a profile is prepared and plans are made for distributing the aboveground and underground construction on the basis of comparative costs.

3. The profile is sent to several foremen and superintendents.

4. A backhoe removes overburden for piers by making a rough excavation, digging sometimes as deep as 2 ft. A backhoe engaged in this work can proceed along the line at a rate of 4 to 5 km. per day.

5. A labor crew dresses the excavation by hand shovels. Such a crew consists of an American supervisor and 15 Arabs.

6. Two Arab carpenters and two Arab laborers set forms for the piers. The forms have previously been oiled on the inside.

7. A transit concrete mixer by five operators pours an average of 200 piers a day. This amounts to about 4 km. a day.

8. Each pier takes about ⅓ cu. yd. of concrete. Bolts for the supports are set in the concrete at the time the pouring is done. Within 15 minutes after the form has been removed and the block has been dressed it is coated with Petrolastic pipe primer and whitewashed. This primer serves as a seal to prevent fast drying of the concrete.

9. By reading the surveyor's notations on the stake by the hub, an Arab learns the type of pier and the height of the concrete above the hub. By use of jig consisting of a horizontal arm in a slotted vertical stick, the Arab indicates to the other workmen the height to which the form should be shimmed up to attain desired final pipe alignment. Bolts for holding the A-frame for holding the girders are set in the concrete when poured.

Pipe which has previously been welded into 4,000-ft. sections is later placed in the ring girders and bolted.

There are 50 ring girders per kilometer with the standard spacing at 20-m. intervals. Ring girders are in two halves which are bolted together.

An anchor point is located at each place where there is a change in pipe diameter, well thickness, or direction. Furthermore, at the upstream and downstream sides of stations the pipe is anchored. Anchors are set on concrete blocks. Observations indicate they do not move.

Anchors as well as A-frames for

(Continued on page 119)

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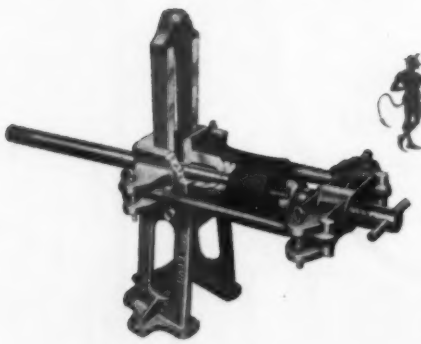

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Complete information in Composite Catalog or write for price catalogs noted above. Red Devil products are available through your supply store.

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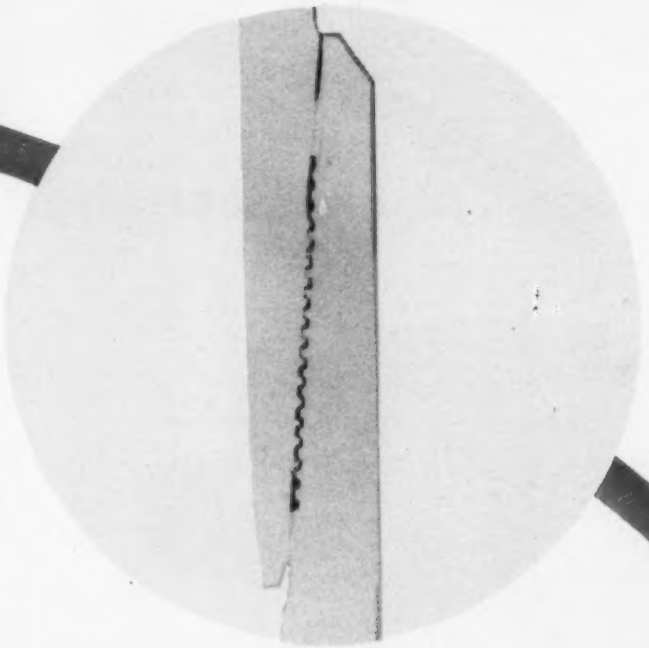

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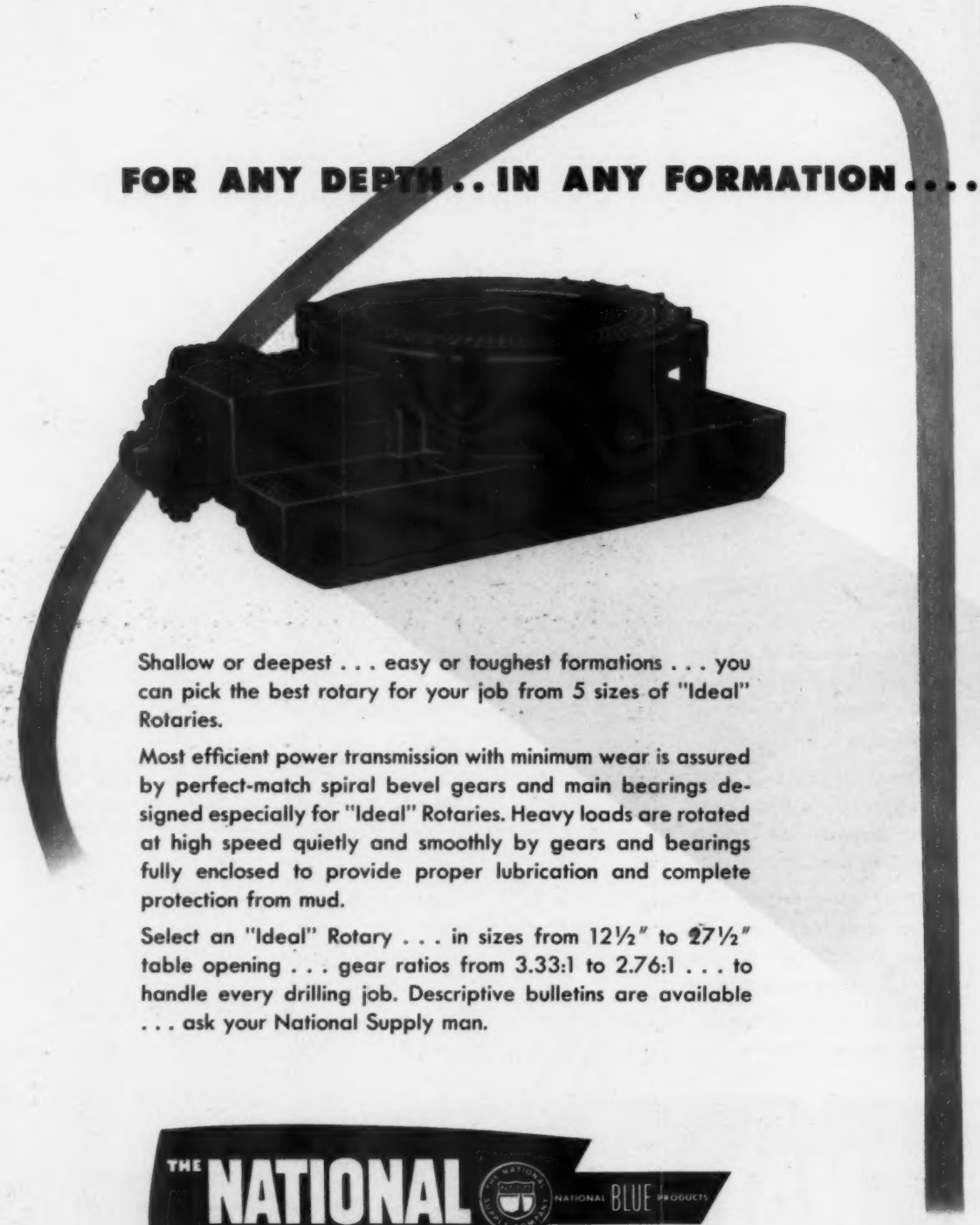

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girder supports have been fabricated in the field. A field crew for such fabrication consisted of 2 Americans and 14 or 15 Arabs. Forged bends of 2°, 3°, and 5° were used for restrained line construction.

In tying in long sections, care has been taken to have tiein welds made at times of the day when the pipe has been at a "mean temperature." The objective was to insure that the pipe would not be under strain. At various locations and seasons of the year, mean temperatures would be different. For instance between stations No. 3 and No. 4 during April and May the calculated mean temperature of say 70° F. might be determined as existing at some time between 8 and 9 o'clock in the morning. Consequently, that would be the time for making the tiein weld there.

Tiein temperatures range from 70° F. in winter to 90° F. in summer at the western end of Bechtel's section; in the cooler high-altitude country the highest average would be 80° F.

These temperatures of the pipe generally occur between 7 and 10 a.m. Welding begins when the temperature is 2° below the specified tie-in temperature. A permanent record is kept for future reference of each tie-in temperature. If it becomes necessary to cut the line later on, the cutting is done at the original tiein temperature in order to avoid compression tension. Atmospheric temperatures recorded in July were as follows: Daylight hours 82°-92° F.; night 66°-75° F. In the desert between eastern Syria and the Persian Gulf: daylight, 100°-120° F.; night, 70°-76° F.

Condition of Pipe Line Determined

The unrestrained condition of the pipe line has been determined from time to time at certain points where it has been necessary to cut a section of welded line. After girders have been unbolted for a distance of a kilometer on either side of the cutting point, it has been found that 2,000 to 3,000 ft. of pipe resting on support developed sufficient anchoring effect.

Where an aboveground section of the line intersects main camel trails and also at other convenient points, crossings have been built up by bulldozers to enable bedouin Arabs to cross over with their animals.

An aerial tram of a type developed for the logging industry was operated at Ras el Misha' ab for bringing pipe from ships to the Bechtel plant. This "sky hook" was the first facility of its kind ever used for pipe lining. It accomplished what was expected of it. This overhead cable system extended 3 miles, with ⅝ mile of it offshore to an artificial island constructed for the project which was 70 by 420 ft.

The sky-hook system consists of two 1⅞-in. wire cables suspended from a height of 80 ft. with A-frame supports at 700-ft. intervals. Cars handling 10-ton loads travel 35 m.p.h. Arabs have become as skilled as Americans in running the sky-hook cars. Communication is by radio between the ground and the cars.

Cars traveling along the cable system, each by an automobile engine could handle three sets of nested 31-ft. joints consisting of a 30-in. joint placed within a 31-in. joint (to save ship cargo space) on each trip. At an average rate, 750 tons per day were handled; maximum capacity is 1,500 tons per day. Usually a pipe ship could be unloaded in 4 days. A great advantage was reduction in the inevitable damage incurred in unloading. It is believed that there would have been three times as much damage by lightering by barges as was experienced with the sky hook. However, Tapline executives do not regard the sky hook as the final answer. The next time such a problem is faced it might be solved by a different type of equipment for such conveying service.

After pipe was unloaded, it was denested at a special rack by pulling the 30-in. joint out of the 31-in. joint. Beveled ends of the pipe were buffed by grit blasting equipment with suction nozzles which recovered the grit for reuse. Sand of a kind suitable

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PRECISION GEARING

General Electric balanced-thrust gears are specifically designed for use with turbine drives. Smoothness and quietness of operation are the result of maintaining tooth contours and spacing to a high degree of accuracy.

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General Electric Type DP and DR turbines include extra features at no extra cost. The DP's hydraulic governing system provides a speed range of 30 per cent with 6 per cent regulation. The DR's oil-relayed governor offers speed ranges up to 5 to 1 with accuracy of ¼ of 1 per cent. Each turbine has its easily operated trip-throttle valve and governing valve combined in one compact unit. Rugged construction from quality materials makes these standard turbines outstanding for reliability and efficiency.

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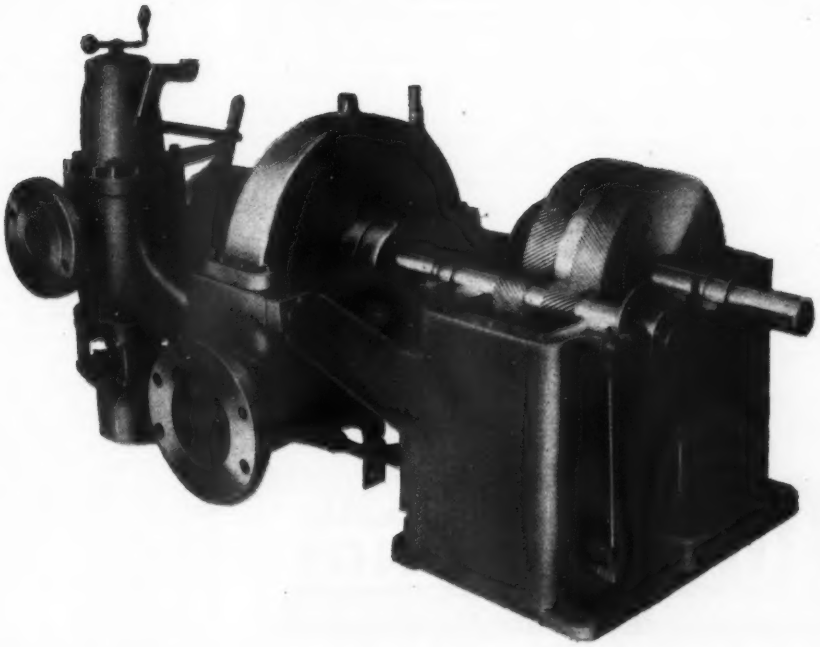
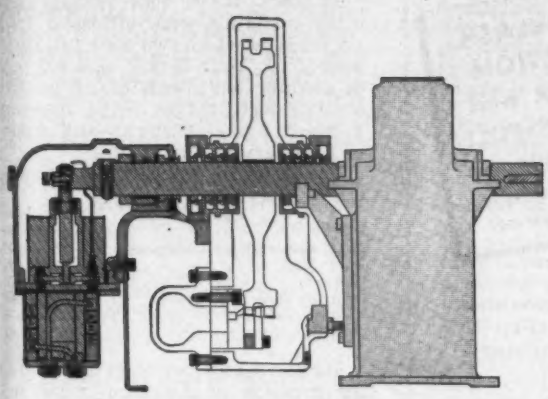
General Electric close-coupled turbine-gear sets have one common turbine and pinion shaft, with the turbine and gear casings solidly connected by a sturdy fabricated bracket. This construction results in a compact unit, does not require high-speed coupling.

Many standard parts are interchangeable with other turbine and turbine-gear drives.

Your nearby General Electric sales office will supply you with full details about mechanical-drive turbine-gear sets. Or, if you prefer, write for free copies of illustrated bulletins on these drives. The DP and DR turbines are described in bulletins GEA-4955 and GEA-5193. Bulletin GEA-5152 contains information about gears. Learn how installing these precision drives in your plant can save you money. Apparatus Department, General Electric Company, Schenectady 5, N. Y.



TURBINE-GEAR DRIVES



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This diagram shows how a standard DP turbine is close-coupled to a low-speed gear using an integral turbine and pinion shaft. All shaded turbine parts are interchangeable on all sizes of DP turbines. Thus, it is easy to stock spares, and maintenance costs are reduced. All individual turbine models and gear sets have standard shaft heights for easy installation or re-location in your plant. In addition, standardization cuts manufacturing expense, and the savings are passed on to you in the form of extra features usually found only on "special" turbine-gear drives.

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for sand blasting was not obtainable in the area about Ras el Misha' ab.

Triple jointing, commonly called "double ending," to form a 93-ft. joint by welding together three 31-ft. joints was accomplished by Bechtel at the Ras el Misha' ab depot by a wholly automatic submerged arc-welding process which functioned with the use of a water-cooled copper backup ring. There was no preliminary manual stringer bead welding. Careful adjustments for temperature changes required skilled attention. Automatic welds were completed in two passes.

Only seven Americans, including maintenance men and supervisors, have been engaged in the triple-jointing operations.

Owing to the large number of welds which it was possible to make at one plant, the project could afford to utilize more expensive equipment than would have been practicable in the United States where road conditions would have prohibited moving 90-ft. joints for distances of several hundred miles. Therefore the Tapline triple jointing may be regarded as basically a procedure suitable particularly to the situation in Saudi Arabia.

Automatic welding of two or three 31-ft. 6-in. lengths of pipe into single strings 63 to 94 ft. long at material-handling bases, eliminates 50 to 66⅔ per cent of field manual welds with the same percentage in required number of field welders and results in a substantial reduction in welding cost.

After some trials, 94-ft. lengths represented the maximum practicable for hauling across the desert. In the rougher, rocky, and mountainous country west of the Arabian frontier, trucking limitations made it necessary to restrict most of the lengths to 63 ft. and some to 31 ft. 6 in., so the economic result of automatic welding in that division was disappointing. A 50-ton truck with dollie usually carried nine lengths of pipe, or 850 ft., at an average speed of 18 to 25 m.p.h. and returned empty at 25 to 30 m.p.h.

Altogether 845 miles of 30 and 31-in. pipe has been handled through the Ras el Misha' ab plant, for denesting and triple jointing.

When the Persian Gulf construction base at Ras el Misha'ab was selected in August 1947, not a single structure existed within 75 miles of it. The base includes the sky-hook installation; the denesting and automatic pipe-welding facilities; the high-tide and low-tide jetties for landing barges; the sea-island structure; four large warehouses; a machine shop equipped to do heavy repair and maintenance work; a light and power plant, a sea-water distillation plant for producing fresh water; a large hospital; recreation hall; several mess halls and kitchens; comfortable barracks for accommodating 600 single Americans; 10 five-room portable cottages for Americans; and an Arab construction camp with mess hall, etc., for housing about 1,200 Arab workmen; and an extensive auto-equipment service shop for lubricating, washing, and repairing automobile and truck tires.

In July, 12,000 tons of pipe and other materials were offloaded from six ships, of which two were full cargo loads from Long Beach, also 605 tons of gasoline and diesel fuel from five shallow-draft barges being operated between Ras el Misha'ab and Aramco's refinery at Ras Tanura.

The trucking department hauled during July:

	Ton-miles
Pipe	5,800,000
Misc. materials and supplies	2,100,000
Fuel	950,000
Water	72,000
Crushed stone and gravel	78,000
Total	9,000,000

For the 3-year period of the project the turnover of American personnel, based on the present number in foreign operations, would be about 100 per cent. Therefore, at least 3,000 Americans must have worked on the job at one time or another, and some all the way through from the beginning.

The peculiarities of the job required a larger proportion of personnel for managerial, administrative, and service functions than a job would be required in this country. For instance, in July Bechtel's foreign staff of American employes consisted of:

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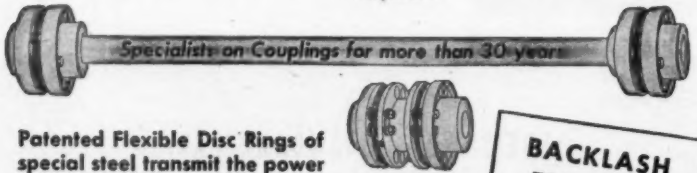

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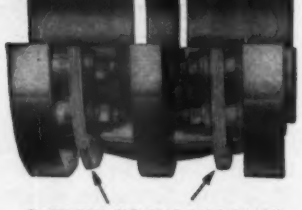

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Management, supervisory, administrative and services	220
Trucking, materials handling, and maintenance	280
Pump-station construction	265
Pipe-line construction	120
Total	885

American personnel turnover was about 4 per cent. A total of 4,945 Arabs were in the eastern division either on Bechtel's payroll or Arab contractors' payrolls. The Arab personnel includes those employed for trucking, material handling, mess halls, and other services as well as those actually doing construction work on the pipe line or at pump stations.

In January, Williams Brothers had 200 Americans on its western division payroll. In July, Americans on foreign payroll had increased to 400. The turnover jumped from an average of 4 or 5 per cent each month to 15 per cent on account of outbreak of war in Korea; 4,400 Arabs were on the July payroll.

Mention should be made of the effect of religious holidays observed by Arab workers, who are Moslems. Each year they observe 30 consecutive religious holidays known as Ramadhan, during which they partake of no food and drink no water between daylight and sundown. Naturally they are in no condition to do work during this holiday season. This year the holidays occurred from June 16 to July 16, inclusive.

Both Bechtel and Williams have trained many Arabs who had never seen even such a common tool as a monkey wrench, for such skills as truck drivers, equipment operators, carpenters, painters, welders, welding helpers, and for all sorts of other pipeline crafts. They are intelligent, willing workers and learn skills rapidly.

In restricted military areas, Williams Brothers' construction was hampered by numerous restrictions including the necessity of carrying on all construction and transportation operations in daylight hours. In the 250-mile approach to the Mediterranean, fully 75 per cent of the ditch required blasting. Approximately 55 to 60 per cent of the ditch is dug by hand. Some of the contracts for Syrian hand labor were as cheap as the cost of machine ditching.

This job was unique because of its isolation from industrial areas in the Eastern Hemisphere. Nothing at all was procurable anywhere except in the western division where fresh vegetables and some perishable foods, also a limited number of builder's hardware items, automobile repair parts, etc., are available from commercial concerns in Beirut and Damascus. Everything else needed for the construction and for human consumption had to be imported. In the eastern division there are no stores or shops of any sort and in both divisions the commissaries at each construction camp had to carry a full line of goods.

International Bechtel, Inc., is headed by Van W. Rosendahl, president. The field organization consists of George S. Colley, Jr., executive vice president; Jack R. McAuliffe, project manager; J. M. Leaver, assistant project manager; P. L. Shobe, administrative manager; Ray C. Middleton, general superintendent pipe line; W. R. Goolsby, assistant superintendent pipe line; C. E. Barker, general superintendent, Ras el Misha'ab base and trucking; J. W. Hillman, general superintendent, pump station construction.

Williams Brothers Overseas Co. field operations have been directed by A. M. Garber, project manager; Thomas A. Wainright, office manager; F. William New, chief engineer; John H. Burroughs, field assistant to the manager in charge of road building; Howard Fisher, stringing superintendent; J. H. McCartney, terminal superintendent; S. E. Thompson, superintendent of commissary and subsistence, and J. H. Humphries and George Allen, spread superintendents. Cecil A. Stanfield, vice president, and Robert L. Buck, executive assistant, expedited arrangements for the project. S. Miller Williams, president, and Guy S. Connors, vice president, made trips to the work while it was in progress. David R. Williams, vice president, was in residence at Beirut, Lebanon, for several weeks this year.

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Seismic Velocities

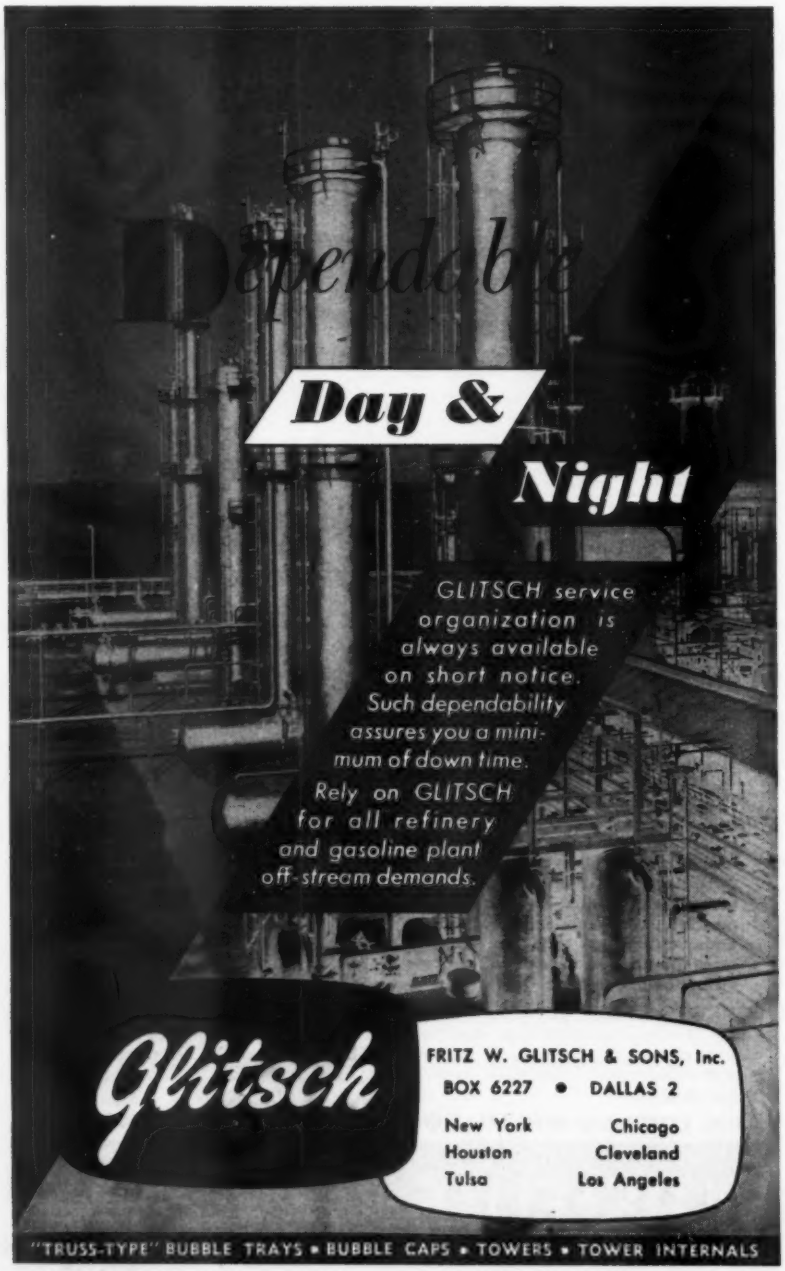
(Continued from page 99)

River (4,310 ft. D.F.), could not be received. The abrupt nature of this loss of receipts is extremely interesting and probably significant. Down to 3,400 ft. the No. 1 instrument showed strong breaks well above the noise level; below that it picked up nothing distinguishable. (See Figs. 3 and 4.)

It is noteworthy that 3,400 ft. (D.F.) marks the lower boundary of the limy portion of the Claiborne, the deeper Sparta and Cane River members being largely sands with interbedded shales.

An attempt was made in these lower members to determine whether there was a difference in energy transmission from shots opposite sands versus shales. No conclusions could be drawn since neither delivered a recognizable signal at that depth.

The results given in the table of statistics are plotted in Fig. 5. The velocity data check with those obtained by conventional methods in this part of Mississippi, a state well known for its low-velocity strata.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Statistics

Well data:

Name: 1 U.S.D.A. 2.

Company: The California Co.

Field: Bude.

Location: 19-5n-3e, 1,986 ft. south and 1,971 ft. west of NE cor.

County: Franklin.

State: Mississippi.

Date: March 8, 1950.

Casing record: 52 ft. of 16-in.; 2,498 ft. of 10¾-in.

Elevation (D.F.): 388 ft.

Total depth: 11,077 ft.

Gunpowder charge and shots:

Side-wall core taker gun: 3 g. or 46.29 grains per chamber.

Gun perforator: 24 g. or 370.32 grains per chamber.

Number of shots: Gun perforator 11.

Conclusions

General conclusions can be drawn from the experiment. The results recorded would seem to indicate that signals generated by routine side-wall coring guns are extremely weak and cannot be used at this time for obtaining velocity data; this might not hold for very high-velocity sections.

A gun perforator can be used as a signal source for shallow-velocity surveys provided precautions are taken to keep the noise level at a minimum. Efficiency of the process is increased by burying the seismometers, eliminating thereby all or part of the low-velocity layer and surface noise.

The first results warrant further experiments:

1. In other areas where higher-velocity media might permit surveys to greater depths.

2. With other types of explosives, or heavier charges of powder so as to increase the signal without danger to the bore hole.

3. With different filter settings or system for better elimination of surface noises.

If the technique described were further developed, factors of convenience and low cost might permit accumulations of velocity data whose abundance would compensate in many ways for a general lack of depth. For instance, quite apart from the problem at depth, a better knowledge of the horizontal variations in velocity within the upper section would advance seismic interpretation almost everywhere. Furthermore, depth itself is relative: 3,000 or 4,000 ft. comprises the entire section of interest in many regions of the world.

Acknowledgment

Permission to publish this article has been granted by The California Co. through the courtesy of J. W. Hoover, vice president of exploration, and by R. Henquet, executive vice president of the Schlumberger Well Surveying Corp.

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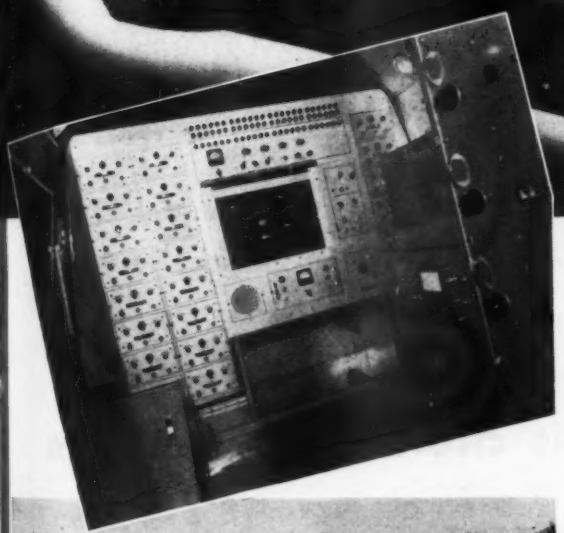

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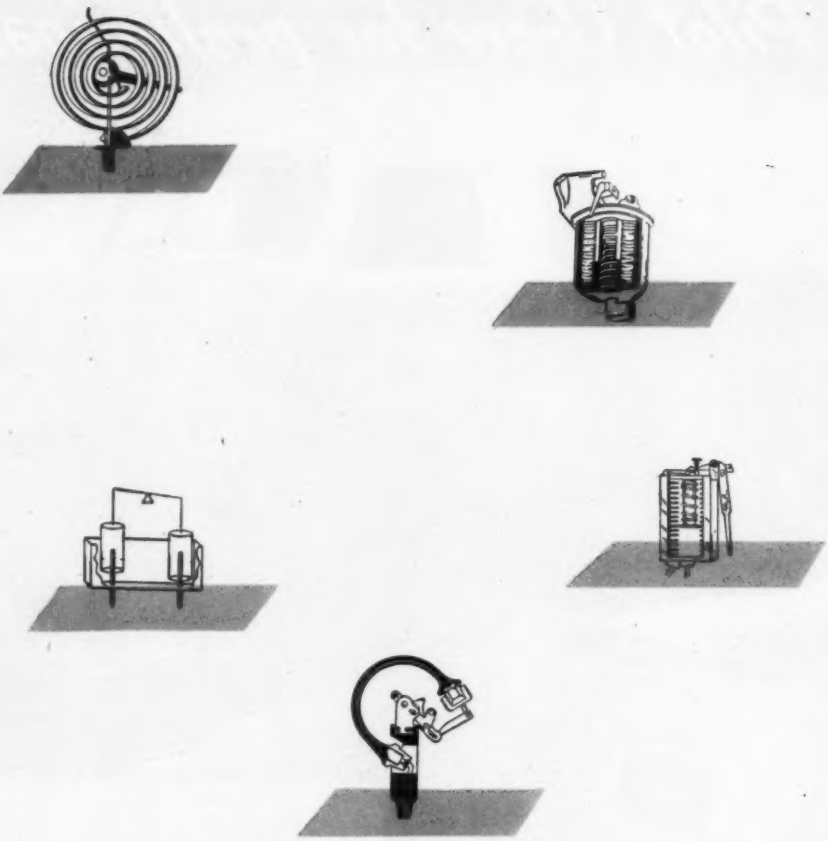

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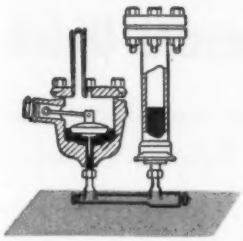

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COMPOSITE ELECTRIC LOGS

. . . Central and North-Central Oklahoma

Here are convenient reference data for the self-potential and resistivity characteristics of the entire Paleozoic section in an active area of Oklahoma

by Philip C. Ingalls
Associate Editor

THE composite electric logs for central and north-central Oklahoma shown here will supply convenient reference data for the self-potential and resistivity characteristics of electric logs for the designated formations, and for the stratigraphic position of these formations with respect to groups, series, and systems. These composite logs include the entire Paleozoic section, which is the only section present in the area except for a few spots of Tertiary alluvium.

Though all of the Paleozoic systems are represented in these areas of Oklahoma, only the lower Permian rocks, which are the surface rocks over most of the area considered, and the uppermost formations of the Pennsylvania system, which outcrop along the eastern edge of the area, can be studied on the surface without going considerable distance away from this portion of the state. The older Paleozoic rocks of this immediate area are known only by well samples, cores, and electrical characteristics.

These areas have undergone several cycles of deposition, emergence, and erosion so that no one hole offers a complete or type section for areas as large as those considered. The composite electric logs shown here, compiled by Schlumberger Well Surveying Corp., were built up by taking characteristic portions of logs from various wells throughout the area indicated.

Discussion of Composite-Type Log

Illustrative of the necessity of a composite log if a complete section is to be reviewed are Burbank, Tonkawa, and Oklahoma City fields.

At Burbank there is a thick and complete section of Pennsylvanian rocks beneath a very thin section of Permian. The Mississippi lime and the Woodford shale are present, but at the base of the Woodford there is an unconformity and the Ordovician Wilcox directly underlies the shale. The Hunton, Sylvan, and Viola were eroded away prior to the deposition of the Woodford.

At Tonkawa a different sequence exists. Here the Permian is thicker than at Burbank. The Pennsylvanian is present in nearly full thickness. The Mississippian is absent on the top of the structure, but does appear on the flanks of the dome. The Siluro-Devonian and Upper Ordivician sediments are also absent on top of the structure so that the Pennsylvanian Cherokee rests directly on the Viola.

At Oklahoma City the first determinable structural movement probably came at the close of Mayes time. Base leveling of the uplifted Oklahoma City area resulted in truncation of the Mayes, Woodford, Hunton, Sylvan, Viola, Simpson, and the top of the Arbuckle on the upthrown side of a large normal fault that developed on the east side of the structure. On the downthrown side of the fault a full section was retained. The Cherokee sea advanced over the beveled ends of the Mayes through the Wilcox rocks and finally covered the Arbuckle exposed on the crest of the eroded structure so that Cherokee sediments are found in direct contact with each of the pre-Pennsylvanian rocks in the area.

Brief Geological History of Central and North-Central Oklahoma

The first deposition in central Oklahoma began during middle to late Cambrian time, when a sea advanced over the igneous basement from the southwest. This sea left the Reagan clastics and, after clearing, the Arbuckle limestones and dolomites, often called the "Siliceous lime" in northern Oklahoma.

At the close of Arbuckle deposition, which was in Ordovician time, there was complete emergence and the upper surface of the massive Arbuckle was eroded. The Simpson formations were then deposited during several oscillations of the sea. These formations are considerably thicker in central than in north-central Oklahoma. After a period of erosion following the withdrawal of Simpson seas, deposition continued without any major break through Hunton time.

The sequence of Viola, Sylvan, and Hunton is essentially complete in this area. This long depositional period was interrupted when the formations were tilted in a southwest direction. A long period of erosion followed, which truncated the formations, and left broad belts of their surfaces exposed. The Woodford shale was deposited on this unconformable surface to be overlain by the Mississippi lime (Mayes).

A prolonged period of folding, faulting and erosion followed the Mississippian deposition. The uppermost rocks were stripped from the structural highs during this period. In places the rocks were subjected to sufficient erosion to expose the Arbuckle.

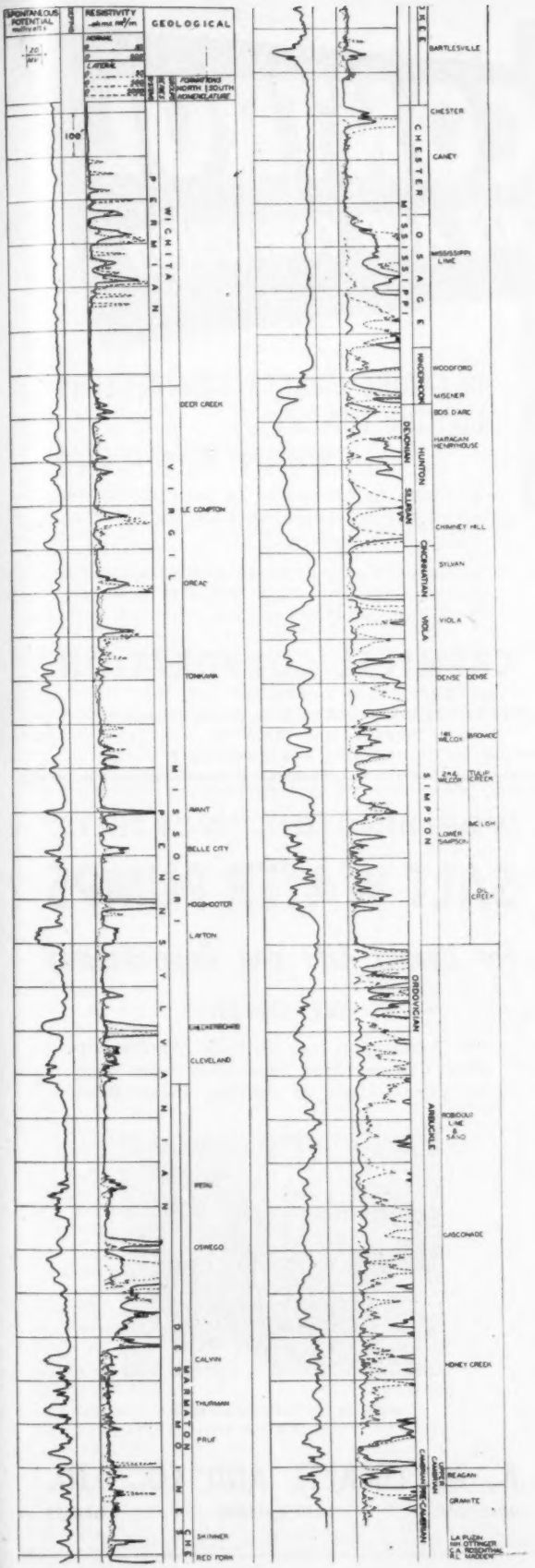
The lower Pennsylvanian sea (pre-Cherokee) did not get far enough north to affect this area of Oklahoma. However, beginning in Cherokee time there was a depositional period during which the later Pennsylvanian and Permian (both marine and nonmarine) sediments were deposited without more than minor interruptions.

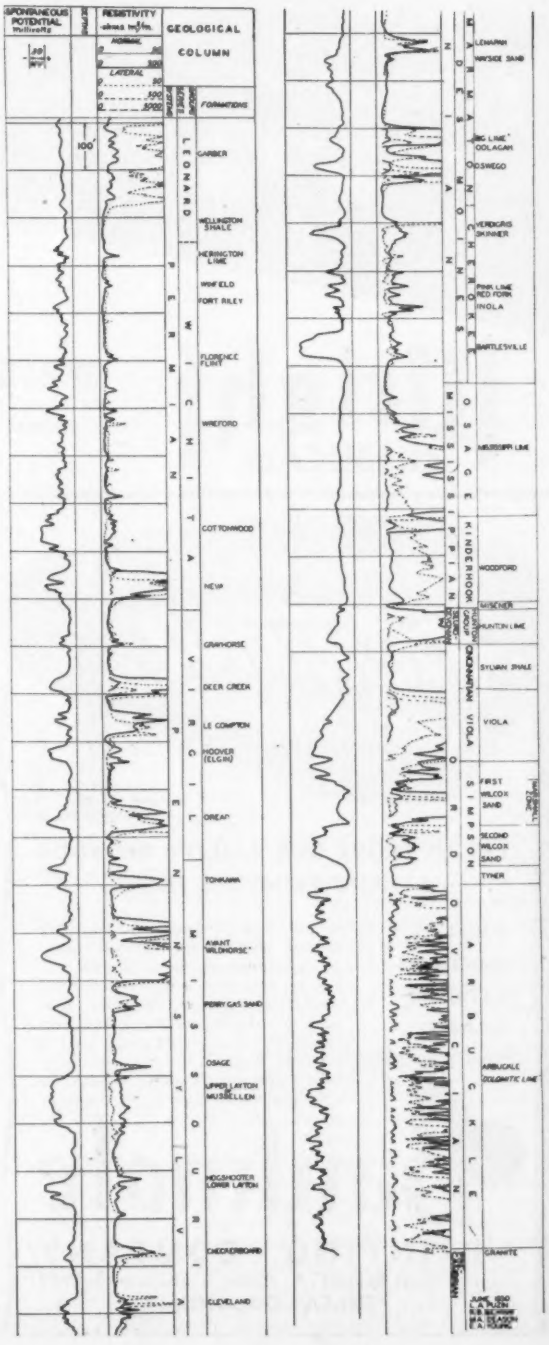
Since the close of Permian time the area has been positive and undergoing erosion. Parts of the area were covered by Tertiary alluvium from the Rocky Mountains for a comparatively short time.

Conclusion

The two composite electric logs shown here were prepared for reference purposes. No well log is going to match this composite log, but with the aid of the general geologic picture of the area presented above, these composite logs can be of assistance in tying down a given logged section.

Below: Composite electric log for Central Oklahoma. Left: Composite electric log for North-Central Oklahoma. These logs are ruled at 100-ft. intervals. No depths are shown because depths are meaningless in a composite log of an area that has been subjected to folding and erosion as these areas have. Reduction is approximately 3.5 to 1 from normal-size electric log.





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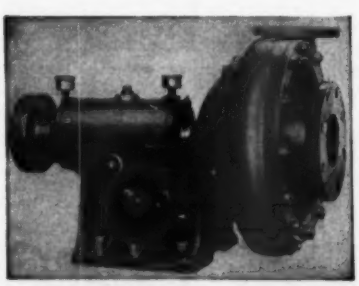

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Gravity Drainage

GRAVITY drainage is one of the types of control usually cited in a summary of oil-producing mechanisms. Its characteristics are not generally very well understood and there is considerable misunderstanding about its relative importance as a producing action.

The action of gravity is always present in a reservoir. This force acts to separate any two reservoir fluids into layers according to their densities or to move fluids through the reservoir rock in a direction demanded by their relative densities in order to restore density equilibrium, or to create a hydrostatic gradient to move a fluid downward through the reservoir when there is an outlet available.

Gravity drainage is itself a gas-displacement process, and thus possesses some of the characteristics of other gas-displacement processes. In gravity drainage, countercurrent flow of gas updip may become important. As a matter of fact, countercurrent flow does not occur unless gravity forces are large enough to be considered. It is not strictly necessary that countercurrent flow of gas occur in gravity drainage, however. As oil drains downstructure it must be replaced by gas. If this replacement can be effected by the expansion of gas-cap gas then countercurrent flow of gas need not result. In any process where it is necessary to replace the draining oil with solution gas, countercurrent flow will occur.

Although no analytical formulations of gravity drainage have yet appeared in the literature, reason brings to mind several conditions which would promote the occurrence of a gravity drainage of oil. The primary conditions are low oil viscosities, high permeabilities to oil, high formation dips, and high density gradients. It is not necessary that all of these conditions be favorable simultaneously. A favorable condition of viscosity for example may overbalance an unfavorable condition of permeability, or vice versa.

To explain these conditions in somewhat more detail, Darcy's law for fluid flow through a porous medium is sufficient. The rate of oil flow, Q_o, per unit of cross-sectional area, A, is given by:

$$Q_o/A = k_o/\mu_o \, dp/dl \qquad (1)$$

where k_o is the permeability to oil, which can be expressed as $k\,(k_o/k)$ if permeability and relative permeabilities are known, μ_o is the oil viscosity, and dp/dl is the pressure gradient.

There is no limitation as to the source of the pressure gradient. It can be a gradient due to a gravity head as is the present case. This head can be expressed in terms of the density gradient, and the vertical gradient can be expressed in terms of distance along the reservoir bedding plane and the dip angle. (See Fig. 1.) Making these substitutions and introducing the proper constants so that the rate of flow is in barrels per day per square foot of area, the equation is:

$$Q_o/A = \frac{7.07\ k\ (k_o/k)\ \rho_o \cos\theta}{2\pi\ 144\ \mu_o} \qquad (2)$$

where ρ_o is the oil density in pounds per cubic foot and θ is the angle that reservoir bed makes with the vertical. Permeability is in darcies and viscosity in centipoises.

Equation 2 is a steady-state equation and cannot apply quantitatively to an actual oil-field drainage because none of the terms are constant with time, but it does suffice to indicate direction and order of magnitude. Thus, it is seen that the rate of drainage becomes larger for high permeabilities, high oil saturations (this controls the value of k_o/k), low oil viscosities, high densities, and high dips. It is seen also that the importance of gravity drainage may vary with the type of reservoir inasmuch as this may affect the k_o/k values.

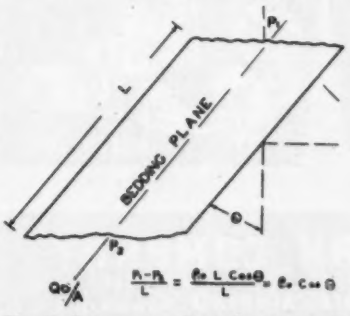

Fig. 1—Pressure gradient due to gravity head.

The maximum dip would be a vertical bed, or a value of $\theta = 0$ and $\cos\theta = 1.0$. An average oil density is $0.8 \times 62.4 = 50$ lb. per cu. ft. Let the relative permeability be about 0.7 representing the maximum oil movement with connate water present. Equation 2 then gives $Q_o/A = 0.273\ k/\mu_o$ bbl. per day per square foot of cross-sectional area. For a 1-darcy reservoir and an oil viscosity of 1 cp. or for a 500-md. reservoir and a 0.5-cp. oil this would be 0.273 bbl. per day per square foot of area. It is reemphasized that this is a steady-state rate for drainage in a linear system.

It is apparent, however, from these considerations that, contrary to popular belief, conditions are more favorable for gravity control under virgin reservoir conditions than under depletion conditions. At that time the value of k_o/k is highest and μ_o is lowest. As the reservoir is depleted, the oil density will increase but not so rapidly as these two factors, both of which change to reduce the amount of possible gravity flow. Under virgin reservoir conditions the potential flow due to pressure differentials created toward the well bore sink is relatively so much greater than that due to gravity that the latter effect is masked or negated by an imposed pressure differential in opposite direction.

Under depletion conditions it is no longer possible to impose pressure differentials to completely mask or negate the gravity head and the latter becomes evident, although conditions for higher gravity rates were much more favorable before depletion. For an oil of 0.8 gravity, the gradient due to gravity is about 0.35 psi. per foot of head. Thus, for a vertical flow over a 100-ft. interval a pressure differential of 35 psi. would overcome the gravity gradient.

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, Penn State College

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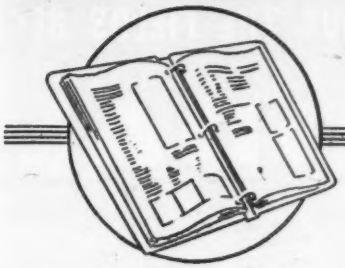

THE REFINER'S notebook

Adjustment of Derivative Controller

IN outlining the elements of an automatic control system (Installment 9) mention was made of certain process characteristics using a steam reboiler system as an example of a controlled process in the refinery. Process lags were briefly discussed in terms of heat-storage capacity and capacitance of the reboiler, resistance to heat transfer and dead time. From time to time reference has been made to the effect of these process characteristics in determination of the mode of control applicable to the particular process.

In addition to process lag and dead time, other factors involved in choice of control mode are (1) amount and speed of load changes, and (2) closeness of control required. In the preceding installment it was noted that where a process is characterized by large lags and dead time, rate ("rate active" or "derivative") response may be incorporated with the proportional mode for small or moderate load changes and with proportional-reset action where variations in process load are large.

Process characteristics. — The term "process lag" is used in a rather general sense to denote process characteristics responsible for time delay in the controlled system. More specifically, the responsible process characteristics are capacitance, resistance, and dead time.

In the case of the reboiler system where temperature is the controlled variable, vapor returning to the fractionating column is the controlled medium and steam to reboiler is the control agent, the process capacitance is expressed as the number of B.t.u.'s transferred from the steam, per degree change in temperature in the same unit time. Resistance to heat transfer is then expressed as degree per B.t.u. per second. These expressions are arrived at by analogy to an electrical system. Dead time is the interval in seconds or minutes elapsing between the time when a change takes place in the flow of steam to reboiler and the the time when this change makes itself felt as a change in temperature at the point of measurement.

Mathematical analysis in terms of these process characteristics and the process reaction curve (see Installment 31) has been presented by Eckman[1]. Eckman has also made a general classification of control modes with reference to these factors.

Influence of rate action.—Incorporation of rate action in a controller makes possible positioning of the control valve according to the speed with which the controlled variable is changing. This effect when added to the proportional or proportional-reset action results in faster response than can be obtained without the rate action. Since the time element is involved it is evident, in general, why the derivative function may sometimes be employed where process lags or dead time exist, or load changes are sudden. By proper adjustment of rate time adverse process characteristics may be counteracted and instability in the controlled system minimized.

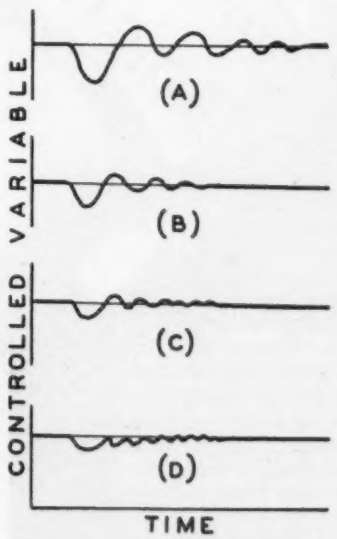

Fig. 1—Showing effect of increase in rate time when making adjustments for a proportional-reset-rate controller.

Rate time adjustment. — If the ultimate sensitivity method of Ziegler (Installment 35) is used, optimum adjustments for a proportional-reset-rate instrument may be made as follows: Opt. sens. = 0.6 S_u, Opt. reset rate = 2.0/P_u and Opt. rate time = P_u/8.

Sensitivity and reset rate may also be adjusted to their optimum values by the alternative method previously described, with the rate time set at zero. The rate time is then increased in successive steps until a cycling response is obtained when it is decreased to obtain optimum setting at the highest value which does not produce cycling. The effect of increasing rate time is indicated in Fig. 1. In (a) adjustment of throttling range and reset rate to optimum values has been made, with rate time at zero. Increase in rate time at (b) has made possible adjustment of the throttling range to a smaller value and the rest rate to a higher value. At (c) the rate time has been set too high. Further increase in rate time as at (d) results in additional cycling with a shorter period.

References

1. Eckman, D. P., Principles of Industrial Process Control, John Wiley & Sons, New York.
2. Philbrick, G. A., and Kidd, W. H., "Principles of Automatic Control," Chemical Engineering Process, September 1948, p. 675.

No. 37 in current series. The Refiner's Notebook has been published continuously since 1944.

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OIL AND GAS EQUIPMENT Digest

IT'S NEW — CHECK IT

TRADE LITERATURE

1 WHEN POWER'S OFF YOU'RE SAFE is a small but interesting new folder telling how any plant can be protected against property damage, production losses, and danger to human life which are the frequent results of electric-power failures. *D. W. Onan & Sons, Inc.*

2 ADSCO STRAINERS AND SEPARATORS, bulletin No. R-46-50A, is a completely revised 16-page catalog of Y and T-type strainers, suction strainers, multiflow separators, and receiver-separators. It contains descriptions, dimensions, weights, and list prices of the entire line. Included in the bulletin are technical data to aid in selecting proper type and capacity. *American District Steam Co.*

3 STEAM JET SYPHONS which operate on the jet principle utilizing the energy of steam under pressure to pump, heat, mix liquids, and handle solids are described and illustrated in a new 24-page bulletin 2-A. *Schutte & Koerting Co.*

4 HOW TO SIMPLIFY YOUR FILES AND FILING SYSTEMS is the subject of a new 40-page booklet based on the premise that many time-saving, work-saving filing techniques are often unknown to the average file clerk. Emphasis is on simplicity and convenience of accurate filing conducted with adequate filing systems. It outlines the essence of scientific filing, detailing various indexing features of a good filing system. *Remington Rand, Inc.*

5 RUSTREM. The bulletin lists complete instructions for the use of Rustrem which can be applied right over rust without wire brushing, scraping, or sandblasting. According to the manufacturer, Rustrem penetrates the rust layer, renders it inactive, and seals the surface against further rusting. *Speco, Inc.*

6 NEW AIR-TRAP BULLETIN is a new four-page bulletin describing a complete line of air traps. Selection and installation of air traps for automatic drainage of moisture from compressed-air intercoolers, after coolers, receivers, separators, and drip points are covered in some detail. *Armstrong Machine Works.*

7 ALL UNDER ONE ROOF is illustrated with action photographs of jobs both in the laboratory and field. This brochure portrays the work of scientists, engineers, consultants, and laboratories. It explains the scope of the services available from this independent organization and touches on such subjects as research, process development, product development, production methods, evaluation, expert testimony, investigations, nondestructive testing and inspecting, laboratory testing, and analysis. *Sam Tour & Co., Inc.*

8 MODEL 221 TRENCHLINER. Attractively printed and illustrated, the new 12-page trencher bulletin shows in detail some of the exclusive Trenchliner features that provide greater production speeds and more versatile operation. *Parsons Co.*

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OIL AND GAS EQUIPMENT Digest NEW CHECK IT

9 HOW MAGNESIUM ANODES ARE USED TO PREVENT UNDERGROUND CORROSION. A new folder describes the cause of underground corrosion and the simple inexpensive way to long-term protection by the use of magnesium anodes. *Federated Metals Division, American Smelting & Refining Co.*

10 METHODS OF WORKING SEAMLESS TUBES AND PIPE OF THE INTERMEDIATE B & W CROLOYS incorporates new data accumulated since 1946. It has been redesigned as a pocket-size book with durable, flexible leatherette covers. Arranged for easy reading, it is briefly but carefully indexed and illustrated with photographs, diagrams, and reference tables. *Babcock & Wilcox Tube Co.*

11 YOUR MOST IMPORTANT RAW MATERIAL. Industrial water problems of all kinds, procurement, treatment, usage, and disposal, and the facilities and services offered in coping with them are described and charted in a new 12-page booklet. *Hall Laboratories, Inc.*

12 ELECTRICAL EQUIPMENT CATALOG. The newly compiled abridged listing features over 85 per cent of the complete line of Condulets, plugs and receptacles, industrial lighting fixtures, industrial controls, panel boards, and signaling devices for hazardous and nonhazardous locations. A section in the back of the book is devoted to ordering suggestions, special metals, special finishes, cord and cable sizes, general wiring, and motor-circuit information. *Crouse-Hinds Co.*

13 SELF PRIMING CENTRIFUGAL PUMPS includes complete information on the new self-priming centrifugal-pump line. Pumps are of a new design that eliminates valves and yet gives efficiency comparable to standard centrifugal pumps. These self-priming pumps are made in sizes ranging from ¼ to 5 hp. with both open and closing impellers. *Goulds Pumps, Inc.*

14 MIXING TECHNICAL DATA SHEET, an exclusive technical chart, assists engineers and operating personnel in quickly checking power requirements for liquid agitation of most types. This information has been compiled from accumulated data on mixing research, tested operating applications, and years of practical experience by mixing specialists. *Process Industries Engineers, Inc.*

15 INSERT-TYPE DIAMOND-CORE BITS is an eight-page, multicolor brochure containing all details of a line of insert-type core bits. Cutting coverage, fluid passage, and insert crown are featured. Triple-track types are illustrated for every formation. *Koebel Diamond Tool Co.*

16 RATOTHERM AND RATOGAGE describes new measuring, exhibiting, and controlling temperature and pressure instruments. Also included is a discussion of the type 3 Pneumatrol unit with proportional band, automatic reset, and derivative action control. *Fischer & Porter Co.*

17 CASTELLATED CONSTRUCTION BROCHURE. This 48-page multicolor brochure effectively illustrates a construction system that reduces the dead weight of a structure, while maintaining or increasing the strength of a span. *United Steel Cos., Ltd.*

18 COMPLETELY UNITIZED AUTOMATIC ELECTRIC WELDER is a four-page folder featuring a 500-amp. machine especially designed for production welding and hard facing. In addition to a horizontal positioner, an angle positioner rotates through 120° of arc. *Leader Welding & Manufacturing Co.*

19 STANDARDAIRE BLOWER gives dimensional and capacity data, engineering layout, typical application data, and important design features, on a line of industrial blowers. *Standard Stoker Co., Inc.*

20 CAST IRON, MALLEABLE AND BRONZE FITTINGS covers the recent additions of cast-iron screwed, flanged, sprinkler, and extra-heavy malleable fittings to the firm's line. *Kennedy Valve Manufacturing Co.*

21 FOSTER FLOW TUBE, a multicolor, four-page data sheet presents all characteristics of a new primary element for the measurement, regulation, and control of fluid flow. Engineers' drawings and performance charts are featured. *Foster Engineering Co.*

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IT'S NEW CHECK IT

by Dan B. Miller

22 SELF-PRIMING CENTRIFUGAL POWER TAKE-OFF PUMPS. Designated as Models 12HG and 14HG, they are supplied with 1½ by 1½-in. and 2 by 1½-in. female threaded suction and discharge connections. Both models provide a safe, quiet, and efficient power-takeoff pump for use on tank trucks in handling gasoline, stove oil, diesel fuel, naphtha, kerosine, light lubricating oils, thinner, and other liquid hydrocarbons with viscosities up to 500 S.S.U. Smaller in size than previous models, the new pumps are specifically intended for service where the required capacity does not exceed 50 g.p.m. They will operate at pressures up to 35 psi. *Marlow Pumps.*

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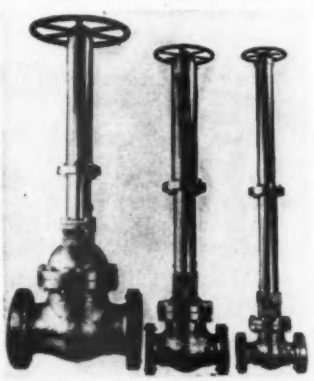
23 ALL-STEEL FLOOR-STAND STEM EXTENSION. The usual cast-iron floor stand has been replaced by a newly designed all-steel extension and steel yoke which connect directly to the valve bonnet. The cylindrical steel yoke and extension thus provided is reported to assure greater rigidity for the stem extension, greater strength with less bulk and dependable, easy operation of extended valve stems. All pipeline or industrial valves can be accommodated by the product. *Kerotest Manufacturing Co.*



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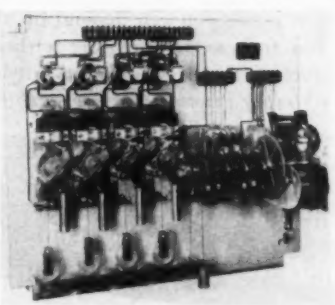
25 NEW PRESSUREFLO CONTROL is a device for automatically controlling pump operation. Consists of a flow-determining means, a pressure or level sensing device, and a mechanism to translate into a control function. May be used to start and stop pumps, to increase or decrease the speed of one or more pumps, to maintain a predetermined pressure at any point or district on a distribution sys-



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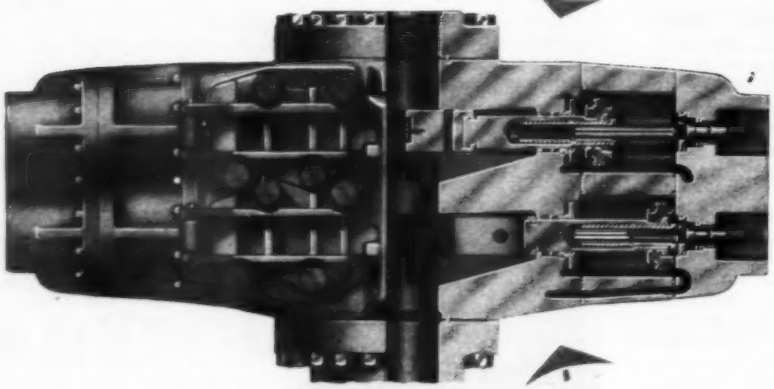

1 There are no outside moving parts to become corroded by chemical muds or salt fluids dripping into the cellar!

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3 There are no exposed shafts where mud and grit can collect to be carried into packing units, score shafts, cause leakage and early failure!

- **No corrosion problems from chemical muds!**
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In fact, not only are all moving parts protected within the body of the Shaffer Hydraulic Cellar Control Gate, but even the locking shaft is non-rising and completely protected at all times!

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▶ **SPACE SAVING COMPACTNESS:** Although *two* separate ram compartments are unitized in *one* body, the overall height of the Gate, including both compartments, is only 30" in sizes as large as 13⅝" (12" Series 900). Smaller sizes even less!

▶ **SIMPLE RAM CHANGES**—the simplest in *any* Gate. Just unbolt and swing open a side door, slide out the ram assembly, slide in the new assembly, close and bolt the door. It's as simple as that—*and complete ram changes can be made whether pipe is in or out of the hole!*

▶ **QUICK DRAINING BODY:** The rams travel on high narrow guide ribs raised above the steeply-sloped bottoms of the ram compartments. Mud and sand quickly drain back into the well—no detrimental accumulations to interfere with free ram operation!

▶ **DIRECT HYDRAULIC DRIVE:** Hydraulic operating cylinders are *directly behind* the rams for direct action, maximum simplicity, greatest safety. No secondary connections between hydraulic cylinders and rams!

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See pages 4433 to 4496 of your 1950 Composite Catalog!

tem, or to automatically adjust both pressure and flow to suit varying demands. *Builders-Providence, Inc.*

IT'S NEW CHECK IT

26 EQUITY STANDARD SPECIAL SERVICE TOWBOAT. This vessel is a special service boat drawing only 15 in. of water. The beam is 11 ft. 1 in. and the molded depth 2 ft. 5 in. The shell plating is 3/16-in. steel; cabin, side, and deck plating is 10 gage with the cabin top of 12 gage. The hull framing is longitudinal with

angle space of 16-in. centers. There is a water-tight bulkhead, 10-gage steel at the forward end of the deck house. Cabin insulation is provided by fiber glass and sheathing is of marine plywood. Windows are aluminum framed. The GM 471, 107-hp. diesel engine with hydraulic shift and finger tip control at the operator's station, makes this a one-man boat. Electric starting and fresh water cooling are built in. Seats approximately 15 or 16 passengers in the cabin. *Equitable Equipment Co., Inc.*

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27 TYGON FLEXIBLE PLASTIC TUBING is now available in bore sizes ranging from 1⅜ to 2½-in. o.d. Its translucency permits quick, visual inspection of flow, facilitates spotting obstructions or foreign material, simplifies cleaning procedures. Inherent ability to resist chemical attack makes it suitable for handling almost all acids and alkalies. The smooth, nonporous surface flushes easily clean. Flexibility simplifies installation, saving footage and time. Its toughness and wear resistance plus its freedom from oxidation characteristics assure long life. *U. S. Stoneware Co.*

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28 MACK MODEL A-40H, a highway chassis model, has wheelbases of 158, 176, 194, or 212 in. The Magna-

dyne six-cylinder L-head engine has a bore and stroke of 4 by 5 in. Piston displacement is 377 cu. in. The A-40H has a rated horsepower of 140 at 2,800 r.p.m. and torque is 302 lb.-ft. at 1,400 r.p.m. The continuous-finned, flat-tube radiator has a frontal area of 560 sq. in. Water capacity is 8 gal.; fuel is 21. There is a 5-speed transmission or a 10-speed Monoshift transmission with a wide range of ratios. Tires on the A-40 are 10.00 22, and its total braking area is 641 sq. in. Front springs are 42½ by 2½ in. rear, 52⅛ by 3½ in., and helper, 38 by 3½ in. The suspension springs are equipped with Mack rubber shock insulators. *Mack Trucks, Inc.*

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29 35-MM. DESK-TOP MICROFILM READER, meets the specific need for a medium-priced reader that does not sacrifice the precision quality essential for viewing microfin records. Designated as model MPE, the new reader will project both 16 and 35-mm. negative or positive film, perforated or unperforated. Magnification is 19 to 1. A scanning device allows the film to be moved laterally so that images the full width of film, can be projected. Any part of the document can be moved to the center of the screen for easier reading. Winding the film by a convenient hand crank provides scanning lengthwise of the film. Projector head has a rotating feature. No matter how the image is positioned on the film, it can be turned upright on the screen. The 20-in. square screen is a reflecting type, and is at desk level for best reading convenience. *Eastman Kodak Co.*

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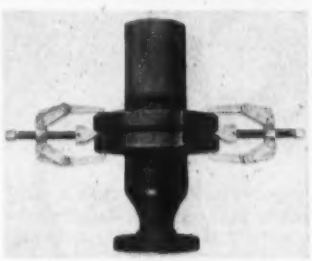
30 NEW PIPE-FLANGE SPREADER. Two Grip-o-matic pullers combine to accomplish a difficult job with two removable wedges on the forcing screws to spread the pipe flanges. An especially useful tool in utility plants, refineries, mills, and industrial plants of all kinds. The jaws are hooked into the bolt holes with the tools opposite each other and the forcing screws are turned alternately to spread the flange uniformly. *Owatonna Tool Co.*



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31 NIPPLE CHUCK for the threading of short nipples, is of simple design which fits any threading machine or vise without special tools, parts, or adjustments, according to the manufacturer. It requires no adjusting or changing of the stop plug which is an integral part of

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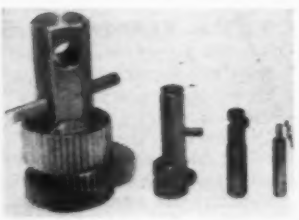
the nipple chuck, and is always automatically in position for use. Nipples to be threaded are screwed in by hand, and after threading, released instantly by an easy turn of the chuck, so they can be unscrewed by hand. Pipe adaptors are made for ¼, ⅜, ½, ¾, 1, 1¼, and 1½-in. pipe; the nipple chuck itself holds 2-in. pipe. Device is made also for British Standard pipe thread. *Ridge Tool Co.*

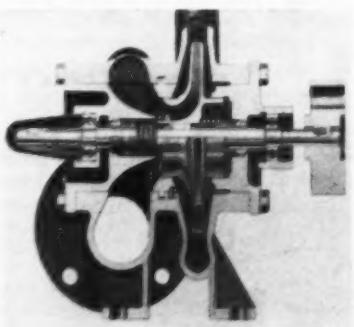
IT'S NEW CHECK IT

32 INTERNAL PIPE WRENCHES are available in a new, broader range of sizes. The addition of the ⅛, 2½, 3, and 4-in. sizes brings to 12 the total number of sizes which can now be obtained. The entire line of sizes is available for use with standard, extra-heavy, and double extra-heavy pipe. With only one simple moving part there is nothing to get out of order or maintain, and the tool is unconditionally guaranteed. Internal pipe wrenches have filled a need for a wrench which can be used either for the installation or extraction of fittings in close quarters where conventional wrenches cannot be used. They have proved invaluable in extracting worn or broken fittings from relatively inaccessible places. *Roddick Tool Co.*



IT'S NEW CHECK IT

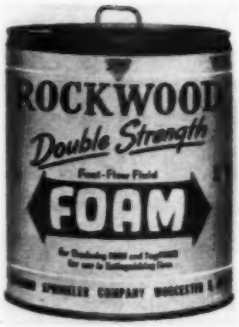
33 DE LAVAL TYPE GS PUMP is designed to fit the idea of a service and exchange plan. All parts except the bare pump casing are contained in the rotor assembly. When maintenance is necessary, simply remove the top cover and end-plate studs, lift out the assembly, and drop a new one in place. Through the plan, new rotors are available for immediate shipment from factory stock. The old one is returned and full credit given for all serviceable parts. As an alternate to this, a customer can exchange the entire pump for a factory-rebuilt and guaranteed pump, with full credit again being allowed for serviceable parts. Simple proved mechanical seals replace the stuffing box and the prelubricated bearings in the pump are like the ones in motor, lubricated for life. GS pump is built in three sizes for capacities to 450 g.p.m. and heads to 230 ft. *De Laval Steam Turbine Co.*



IT'S NEW CHECK IT

34 NEW PACKLESS REDUCING VALVES, is both pilot operated and direct operated in sizes up to 3 in. This new feature, added without any changes being made in the external dimensions of the valve, is completely frictionless, eliminates sticking stems, giving added control to valves already holding within 1 oz. on reduced pressure. *C. E. Squires Co.*

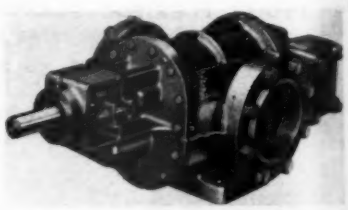
IT'S NEW CHECK IT



35 FAST-FLOW FLUID FOAM. This new type Foam extinguishes fires in gasoline and other similar flammable liquids fast and economically. It is fluid, fast spreading, and will flow at subzero temperatures. Where proper proportioning is provided, double strength foam liquid can be used in the latest types of Fog Foam and Foam nozzles in hose lines or fixed piping systems. It is easy to handle and requires only half the space for storage and shipping. *Rockwood Sprinkler Co.*

IT'S NEW CHECK IT

36 3600 SERIES ROTARY PUMP is rated at 300 g.p.m. at 360 r.p.m. and may be driven by geared head motor, gasoline engine, or truck power takeoff. This pump has the venturi suction and discharge principle which spreads the liquid over wide helical gears for smooth flow and high efficiency. The pumping elements, hardened alloy iron helical gears, are fully supported on both sides by bronze sleeve bearings. The steel shafts are induction hardened at all bearing and packing surfaces. A lantern ring in packing box reduces pressure on packing for long effective sealing. Drain back from lantern ring automatically reverses if pump rotation is changed. The base is constructed so that it can be easily adapted to steam fitted operation for handling thick, viscous liquids. *Geo. D. Roper Corp.*



IT'S NEW CHECK IT

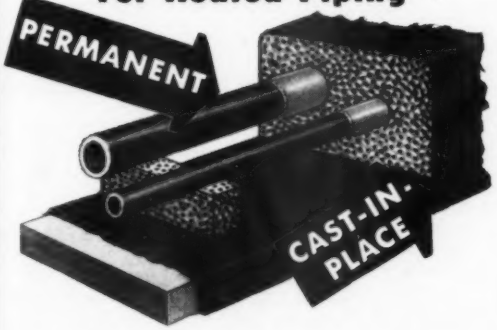
37 AEROMASTER FAN FOR INDUSTRIAL COOLING is applicable to engine jacket water coolers for natural gas, gasoline, or diesel engines; vertical air discharge condensing units; various oil-field and power utility air coolers and water coolers; and large air-conditioning systems. Increased efficiency makes possible either a greater cooling capacity with the cooling unit currently in use or an equal cooling capacity with a smaller horsepower consumption. Fan diameters range from 6 to 20 ft. The largest of the new fans, 20 ft. in diameter, is capable of delivering 500,000 cu. ft. of air per minute and is designed for continuous, open air operation. The fans are being manufactured in sizes ranging from 6 to 20 ft. in diameter. *Koppers Co., Inc.*

IT'S NEW CHECK IT

NO JOINTS OR VOIDS

IN "Z-crete*

UNDERGROUND INSULATION
For Heated Piping



Check these 6 outstanding features of the Z-Crete system and see why Z-Crete provides the perfect answer for underground heated pipe insulation.

1. **More efficient** than most other methods. At least six inches of insulation around pipes. Solid monolithic construction eliminates heat losses due to air movement.

2. **Costs less to install.** No concrete box or armored casing required under ordinary conditions. Provision for drainage is usually unnecessary. No metal supports or prefabricated units that require careful handling.

3. **Gives added protection from moisture.** Monolithic, without joints or voids. Water is less apt to collect around pipes. Solid water repellent insulation restricts water movement. Z-Crete will not corrode embedded metal parts or pipe.

4. **Permanent.** Z-Crete will not rot, disintegrate or deteriorate if wetted. Resilient. Rodent—vermin proof—permanent as the earth itself.

5. **More adaptable.** Any size, number or arrangement of pipes can be insulated in one conduit.

6. **Requires no critical materials.** Z-Crete materials are readily available from plants in key locations throughout the country.

Z-Crete is a patented product, sold and installed only by licensed applicators. There is one near you. For his name, and further helpful underground insulation data, write

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That's right—Barton Flowmeters need no maintenance at all. The usual sources of trouble, such as loss or emulsification of mercury... pressure-bearing leaks... the need to lubricate... condensates collecting in the housing... over-ranging damage... pen flutter—all have been eliminated, thanks to these exclusive features:

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- **Pulsation Dampener, Adjustable Externally**

Model 200 Indicator

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for measuring:

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Write for details on the service-free construction of Barton Meters in Bulletin 11C4.

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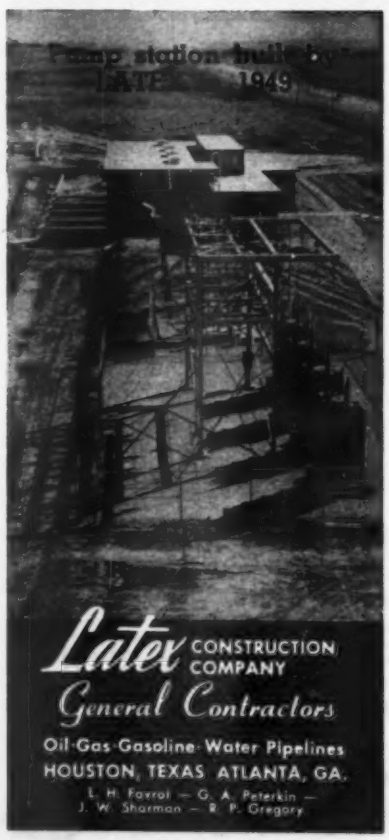
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PIPE LINES

Sun-Yount Lee Line Sold

BEAUMONT, Tex. — Ownership of the Sun-Yount Lee pipe line in East Texas has been acquired by Sun Pipe Line Co. (Texas), which purchased the outstanding one-third interest in the line held by Stanolind Oil & Gas Co.

In announcing the purchase, William C. Kinsolving, president of Sun Pipe Line, also reported completion of a 2½-mile eastward extension of the line to make a connection with storage tanks of Mid-Valley Pipeline Co. This company's 1,000-mile crude-oil line from Longview, Tex., to Lima, Ohio, is nearing completion.

The Sun-Yount Lee pipe line extends 203 miles from the East Texas oil field near Longview, to Sun Station on the Neches River near Beaumont. The 10-in. line has a daily capacity of 50,000 bbl.

Property includes 146 miles of gathering lines ranging in size from 2 to 8 in., and 6 main-line pumping stations. Sun Pipe Line is a subsidiary of Sun Oil Co. Mid-Valley's line is owned jointly by Sun and Standard Oil Co. (Ohio).

Pan-Am Line Dedicated

SNYDER, Tex.—Pan American Pipe Line Co.'s new crude-oil line from Scurry County, Texas, was dedicated this week at ceremonies held in the division headquarters of the company here. Officials attending the celebration included Ira O. Walker, president, Houston, and P. J. Sweeny, chairman of the board.

The pipe line, constructed at a cost of $2,500,000, will provide an additional outlet for increased production from the Canyon reef fields situated on the eastern platform area in West Texas.

The line begins 6 miles northwest of Colorado City, site of a new 800-hp. compressor station. It extends southward to a point approximately 25 miles west of San Angelo, where it joins with Humble Pipe Line Co.'s new 18-in. trunk line which terminates at Satsuma. Humble operates a multiple line from Satsuma to Texas City which serves the Pan American refinery in the latter city.

At the Colorado City station, three 55,000-bbl. storage tanks have been completed and are now receiving oil from gathering systems in Scurry, Borden, and adjacent counties.

Present capacity of the Pan American line is 37,500 bbl. per day, but completion of a booster station will raise the capacity to 55,000 bbl. per day.

Brown & Root Construction Co. of Houston was contractor on construction of the line and station facilities.

Pan American has also completed construction of a crude-oil outlet for the Pine Mills and Earl Lee fields in southeastern Wood County, Texas. The line, comprising 8 miles of 6-in. pipe, extends to its Sabine station in the Hawkins field. Earlier, the firm had been trucking out the oil to Hawkins.

Tapline Nearing Completion

Pipe laying on the 1,000-mile crude line of Trans-Arabian Pipe Line Co. from the Persian Gulf to the Mediterranean Sea is progressing at a rate which indicates that before the end of this month the last weld will be made connecting the sections laid by International Bechtel, Inc., and Williams Brothers Overseas Co. Testing and filling started in June at the pump station at Abqaiq, Saudi Arabia, at the eastern end of the line.

One of the features of this line is that many sections across rocky ground and exposed limestone were laid aboveground with a novel type of restrained construction, although the greater portion is buried in the conventional manner. An article on Tapline's difficulties in last week's issue of the Journal erroneously stated that work has progressed steadily since April 1948, whereas actually it was not until April 1949 that the major difficulties were out of the way. Another article on Tapline appears in this issue of the Journal, and others will follow.

The line was designed by J. L. Culbertson, P. P. Nibley, H. B. Britton, W. G. Heltzel, S. P. Johnson, A. E. Olson, Oscar Wolfe, and other engineers. Tapline's field staff now headquartered at Beirut consists of A. N. Horne, vice president and general manager; W. E. Locher, manager of operations and maintenance; W. R. Chandler, assistant general manager and chief engineer; G. H. Gossens, assistant to the general manager; W. A. Campbell, manager of government relations; C. Cypher, lands and right-of-way agent; W. L. Owen and F. W. Bates, attorneys; Dr. H. A. Lomas, medical officer; D. T. Pinckney, general superintendent of the eastern division; V. E. Jensen, manager of accounting; D. K. Wallace, personnel manager, and A. C. Nelson, chief dispatcher.

Pipe to Be Reclaimed

A 12½-mile 16-in. pipe line will be reclaimed by Cities Service Gas Co. and a new line installed parallel to the old line. The old line, known as

Put your finger on the toughest valve job in your plant—

that's the spot for you to test this remarkable

Cameron

NON-LUBRICATED

LIFT-PLUG VALVE

The valve that functions satisfactorily, seals tightly, operates easily, requires no lubrication for efficient sealing and thus gives freedom from worries about maintenance and line product contamination under your toughest service conditions, is sure to be equally desirable for ordinary refinery service.

Hydrofluoric and sulphuric acids, chlorine, gasoline distillate, light hydrocarbons . . . these are what we mean by "tough valve jobs". And the basic Cameron Valve design, with recommended trims for the plug and seat, will give you the efficient performance and freedom from maintenance that cannot be obtained with ordinary gate and plug valves.

The basic Cameron Valve design, with slight modifications, is also providing excellent service under extremely elevated temperatures.

Your inquiries are invited, and complete details on the unique mechanical design of the Cameron Non-Lubricated Lift-Plug Valve will be gladly sent on request.

1 LIFT PLUG ACTUATOR: lifts, turns and reseats plug in only three-quarters of a turn of the operating wrench.

2 SEPARATE, RENEWABLE SEAT: Pressure-created body deflections and line strains cannot destroy the geometry of the fit between sealing surfaces because they cannot be transmitted to the separate seat. In fact, line pressure improves rather than destroys the seal.

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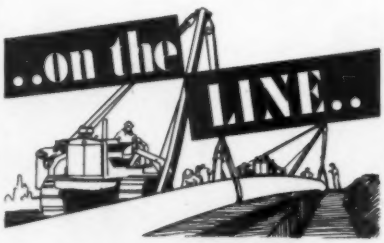
the company's St. Joe 16-in., was first put into service in 1909. It begins at the Franklin - Douglas County line, Kansas, and runs north to Haskell Junction, near Lawrence, Kans., and serves the Topeka area. All work will be done by company crews.

The firm reported that revamping of its Wichita compressor station is expected to be completed with the next 30 days.

Pipe-Liners Club Formed

HOUSTON.—The Pipe-Liners Club of Houston has been formed to promote pipe-line engineering and improvement of operating practices. First meeting has been scheduled for September 18, with preliminary activities under chairmanship of J. E. Green of Shell Pipe Line Co.



The Oil and Gas Journal this week presents a new feature, "On the Line," which will be carried from time to time, highlighting operations of various pipe-line-contracting firms.

2,000 Miles of Line in 5 Years Is Midwestern Record

WITHIN the past 5 years, Midwestern Constructors, Inc., Tulsa pipeline-contracting firm, has laid more than 2,000 miles of line ranging from 2-in. to 30-in. in diameter.

The company, in a 10-year period, has been active in 21 of the 48 states, and among lines laid were large portions of the Big Inch and Little Inch lines of War Emergency Pipelines, Inc.

Personnel.—Midwestern Constructors is headed by F. E. Stanley, president, who was instrumental in organizing Gulfcoast Northern Gas Co., and who handled that firm's development into an undertaking which was later merged with Texas Illinois Natural Gas Pipeline Co. He also organized Associated Natural Gas Utility to serve 13 communities in southeastern Missouri.

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HYDRAULIC AGITATED KETTLE . . . Model 211-30, 30 barrel capacity equipped with hydraulically controlled agitator, low pressure burner, dial type thermometer and a Wisconsin air-cooled gasoline engine with electric starter. The burner distributes heat equally over all parts of the bottom, and is designed to avoid hot spots, thus eliminating replacing bottoms. Available on Athey tracks or on skids. Also available in 23 barrel capacity.

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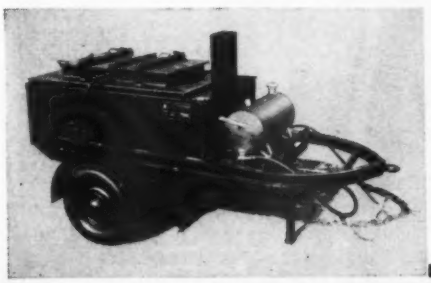

HAND AGITATED PATCH KETTLE. . . Model 84-HD, 225 gallon capacity. This kettle has a manually operated agitator and can be operated from either side. Fast trailing is possible with the Model 84-HD Kettle. A one man operated stiff leg of strong channel iron is provided at the front to support the kettle in the standing position. Also available in 165 gallon capacity.

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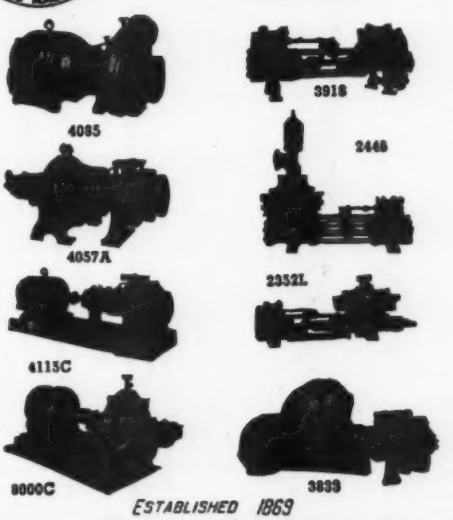

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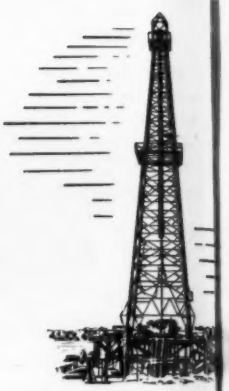

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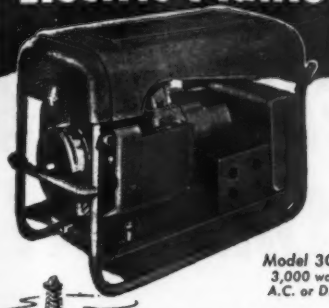
ONAN *Oilfield* **Electric Plants**



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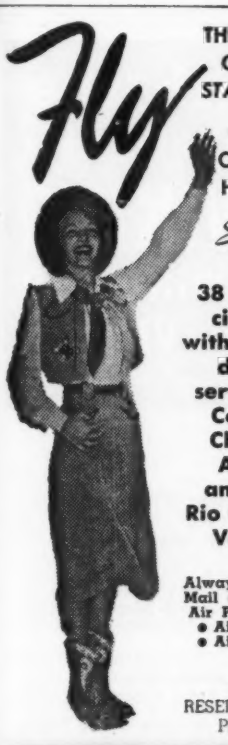

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DENVER FRANKLIN

Clyde Wyant is vice president of Midwestern, and C. C. Bledsoe is secretary-treasurer. Field superintendents are R. C. Stanley and W. T. Wilhite, and spreadmen include John Work,

GRACE GEORGE

A. T. TOLLERT

Denver Franklin, and Mac Hoffman. Home-office affairs are handled by T. F. Hansen, assisted by Ray Robertson. Field-office managers are A. T. Tollert and Miss Grace George.

Operations.—The largest undertaking now under way by Midwestern is its portion of Texas Illinois' natural-gas line, which will run from Texas to the Chicago area. Midwestern will lay 410 miles of 30-in., with operations beginning on a 100-mile section near Du Quoin, Ill., under John Work. Another 100-mile section will begin near Kingsville, Tex., under W. T.

MAC HOFFMAN

JOHN WORK

Wilhite. The firm has also under construction Northern Natural Gas Co.'s 100-mile, 26-in. loop, which is 70 per cent completed, and Great Lakes Pipe Line Co.'s 142-mile, 12¾-in. Atchison, Kans.-Omaha section.

Midwestern has also done work for Southern California Gas Co. and Southern Counties Gas Co. of California, recently completing 83 miles of 30-in. in record time through Los Angeles' suburbs, and over rugged terrain. The firm also handled construction of an 80-mile, 26-in. section in Indiana and Ohio for Texas Gas Transmission Corp.

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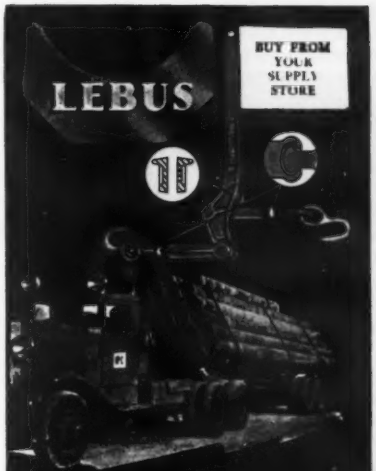

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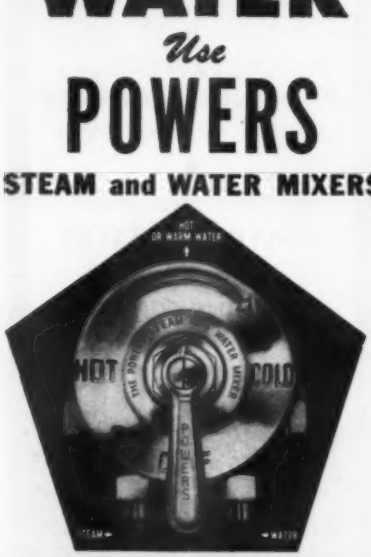

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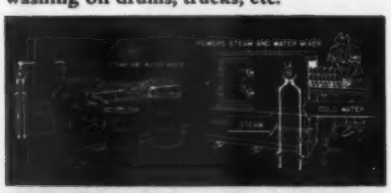

TEMPERATURE RANGE—Any temperature desired between that of incoming water and 200° F.

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CAPACITIES—based on steam and water at 45 lbs. pressure each, water at 60° F., and delivery temperature of 160° F.: —½" size =3 gals. per min.; ¾" size=8 gpm. Mixing steam with 140° F. water increases delivery about 75%. Often used as a small booster heater. ***WRITE for Bulletin 358-S***

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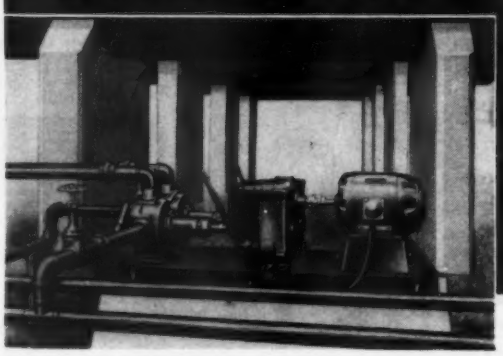

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NATURAL GAS

Gas Revenues, Sales Gain

WASHINGTON. — Operating revenues of natural-gas companies reporting to the Federal Power Commission totaled $81,933,780 in June, an increase of 25.4 per cent over the $65,312,999 reported for the same month a year ago.

Gas-utility operating income for the month amounted to $12,845,266, up 50.5 per cent from the $8,535,204 reported for June 1949, FPC reported.

Gas sales to ultimate consumers for the month were 135,329,000,000 cu. ft., an increase of 17.9 per cent over the same period last year. Sales to residential consumers increased 24.1 per cent, and to commercial and industrial consumers 20.9 per cent and 16.8 per cent respectively.

Revenues from sales to ultimate consumers increased 19.9 per cent, amounting to $37,389,316. Revenues from the three classes of service, residential, commercial, and industrial, increased 23.7 per cent, 18.5 per cent and 17.3 per cent respectively.

For the 12 months ended June 30, 1950, gas-operating revenues aggregated $1,090,188,661, an increase of 16.9 per cent over the total of $932,839,399 reported for the prior year. Net income for the period amounted to $158,265,878 compared to $130,759,676 for the previous 12 months, an increase of 21 per cent.

Record Gas Consumption

WASHINGTON.—Gas demands from electric-utility power plants climbed to a new high during July, breaking the exceptional June record, while the demand for fuel oil declined, the Federal Power Commission reported last week.

Total gas consumed for the month was 66,707,524,000 cu. ft., an increase of 9.4 per cent over the previous high set in June, and 19.2 per cent above the amount burned in the same month last year.

El Paso Files Statement

WASHINGTON. — To maintain a capital structure that will support its expansion program, El Paso Natural Gas Co. has filed a registration statement with the Securities and Exchange Commission seeking registration of 230,000 shares of its $3 par common stock.

When El Paso sought permission to build a natural-gas pipe line from the San Juan basin in northern New Mexico to Topock, Ariz., FPC recommended an expansion in its capital. The system will supply gas to several cities in Arizona and New Mexico and also serve Pacific Gas & Electric Co. of California.

Stock Exchange Proposed

HOUSTON. — Majority control of Sterling Oil & Gas Co. is involved in the offer of Tennessee Gas Transmission Co. to exchange Tennessee stock for that of Sterling on a basis later to be determined.

Authority to register additional shares of Tennessee common stock for use in the proposed exchange was sought in a statement filed with the Securities and Exchange Commission in Washington. The right to exchange will expire October 6, according to the proposal.

Tennessee now owns approximately 40 per cent of the outstanding Sterling common stock.

***CONTINENTAL GAS PLANTS.**—At top is Continental Oil Co.'s Rincon natural-gasoline plant near McAllen, Tex., which was recently expanded from 13,000,000 cu. ft. to 20,000,000 cu. ft. daily capacity, and which now produces 6,000 gal. of L.P.G. and 25,000 gal. of gasoline per day. Below, the Slick-Wilcox gas-compressor plant operated by Continental near Kenedy, Tex., which has a rated capacity of 10,800,000 cu. ft. of gas daily. Another plant, the Todd natural-gasoline plant in the Todd (Deep) field of Crockett County, Texas, was recently completed, and has a daily capacity of 60,000 gal. daily.*

Natural Gasoline

Underground Storage O.K.'d

Underground storage of butane and propane has been approved for the Keystone field of Winkler County, Texas, by the Texas Railroad Commission. The L.P.G. will come from a gasoline plant operated jointly by Ojai Oil & Gas Corp., Sid Richardson Gasoline Co., Sharp Gasoline Co., and Phillips Petroleum Co.

Storage in the underground area will be made between the 1,161-1,170-ft. level. Tests indicate that from 96.6 to 99.6 per cent of the injected products can be recovered.

O.N.G. Buys Plant Interest

Oklahoma Natural Gas Co. has acquired from Carter Oil Co. a 26 per cent interest in the Garvin County plant system which serves fields in McClain and Garvin counties, Oklahoma.

The system consists of three natural-gasoline plants processing natural gas, located at Maysville, Lindsay, and Antioch. Further equipment is being installed to process an increased volume of gas developed in the Golden Trend field.

Carter was one of the original group of companies that constructed the plant to conserve the natural resources through repressuring operations. The plants now process approximately 110,000,000 cu. ft. of natural gas daily.

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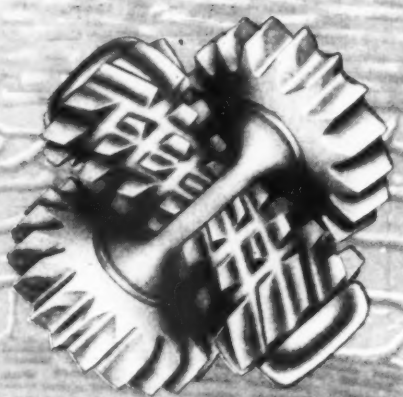
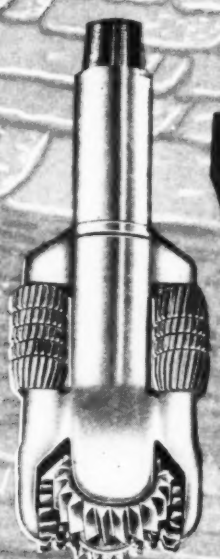
These long teeth make hole *fast* in unconsolidated formations, such as top hole digging, and also have proved successful in hole straightening. The type Y is also available with shorter, heavier teeth which has made good footage in some of the harder formations.



TYPE K-2P

Many operators rely on this bit for *fast, straight, full gauge* hole in many medium-hard formations.

NOTE THE EXTRA-LONG TOOL-JOINT COLLAR.



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Among the Drilling Contractors

Largest Mast Used by Loffland in California

Loffland Brothers Co., Tulsa, has run 11,520 ft. of 7-in. casing in an extension well it has drilled for Stansbury, Inc., on the southwest side of the Rio Bravo field, in Kern County, California. The well is one on which the contractor has used a 142-ft. portable mast, the largest of its kind and the first of its size on the West Coast. The new mast is designed to handle loads required in drilling to depths of more than 15,000 ft. "Pete" Peterson has been toolpusher on this job.

Steam Rig Converted

Drilling & Exploration Co., Inc., Los Angeles and Dallas, is using a rig which it has recently converted from steam to mechanical power drive in drilling a well it has just started in the Ventura field, coastal California. The rig now is powered by six V-12, 400-hp. engines. The well, being drilled under contract for Lloyd Corp., will be taken to the field's D-7 zone around 12,000 ft.

Lomax Moves to Midland

Lomax Brothers Drilling Co. has moved its headquarters from Odessa to Midland, Tex. The company, owned jointly by Pete and Paul Lomax, currently is operating two rigs, both in West Texas. One is on a wildcat being drilled for Lomax, Zonne and associates in northeastern Howard County. The other is on a field well in southeastern Borden County.

New Contracting Firm

A Texas charter has been granted Boswell Drilling Co., Inc., a newly incorporated drilling contracting organization at Odessa, Tex. S. E. Snow William P. Bosworth and Margerite Bosworth are incorporators.

Ed Rumley, Oklahoma City, ha moved a rig into the Guthrie poo area, Logan County, Oklahoma, wher he will drill for Ashland Oil & Refining Co. at 1 Sigl, NW SW NW 7-17n-1w.

Southeastern Drilling Co., Dalla and Jackson, Miss., is starting a Tuscaloosa sand test in Wayne County Mississippi, on a contract with Fred LaRue of Jackson. The location in the SE NW 31-9n-5w, is on a Sun Oil Co. farmout.

E. K. Carey Drilling Co., Denver is drilling a wildcat test for Carter Oil Co. on the Harrisburg structure, Washington County, Colorado. The test is 1 Sheetz, SE SE SW 11-3s-15w.

H. O. (Tex) English, Casper, a comparatively recent entrant for the drilling contracting business, has a contract to drill a test south of the Huntsman pool, in Morrill County, Nebraska. The test will be drilled for

Day-tour crew for Fain-Porter Drilling Co., Oklahoma City, on a rig drilling for Stanolind Oil & Gas Co. in the active southeast extension area of the Velma pool, Stephens County, southern Oklahoma. Left to right: Ernest Dahl (driller), Lloyd Collingworth, J. C. Fox, Elton Lamb and Fred Noe. Currently, the rig is on Stanolind's Union School lease, just south of the Alma townsite. Location is in the NE NW NW 3-2s-4w.

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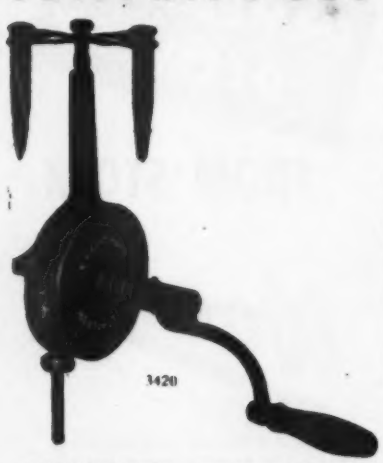

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HOUSTON, TEXAS NEW ORLEANS, LA

Macauley & Dorough of Denver, and is located in the SE SE SE 12-13s-51w. Contract is for 4,800 ft.

Olson Drilling Co., Tulsa, has been awarded the contract for the deep wildcat test which Stanolind Oil & Gas Co. is starting in the area southwest of Cordell in Washita County. Location for the test, 1 Slatten, has been made in the C NW NW 13-9n-18w. Contract is for 10,800 ft.

S. B. Roberts, Abilene, Tex., has contracted to drill a test for Frank and George Frankel and Shell Oil Co. in Section 26, HE&WT Survey A-1,136, 2 miles south of Tankersley, Schleicher County, West Texas. The well will be 1 R. S. Williams.

Tiger Drilling Co., Oklahoma City, has a contract with Ashland Oil & Refining Co. to drill a 6,500-ft. test, 1 Calvert, in the NE SW SW 14-8n-1w, southern Cleveland County, Oklahoma. The location is 10 miles southeast of Norman and about 4 miles southwest of the Southeast Denver pool, nearest production.

M. H. O'Connell, shot-hole drilling contractor, has moved his headquarters from Gillette, Wyo., to Casper. He operates 6 shot-hole rigs.

Trigg Drilling Co., Oklahoma City, is starting a wildcat test for its own account at 1 Blake, NW NW NE 22-16n-2w, ½ mile south of Guthrie, Logan County, Oklahoma. Hole is projected to 6,200 ft.

Jackson Drilling Co., Wichita, has a rig working for Westgate-Greenland Oil Co. at wildcat location, 1 Hurty, SE NW SW 12-23-3w, a mile east of the South Stucky gas pool, Harvey County, Kansas.

Penrod Drilling Co., Shreveport, has a Gulf Refining Co. tract for a 6,300-ft. Wilcox sand test to be drilled 2 miles south of the Aline Lake field, Avoyelles Parish, coastal Louisiana. Location is in 13-4n-4e on Gulf's Altheimer estate lease.

ROTARY RIGS IN OPERATION*

(United States and Western Canada)

Area—	Week ended 9-4-50	Change week ended 8-28-50	Change week ended 9-5-49
Gulf Coast	522	+19	— 6
W. Tex.-N. M.	732	— 3	+205
Ark.-N. La.-E. Tex.	142	— 9	— 9
Oklahoma	281	— 9	+ 48
Kansas	127	—10	+ 20
Illinois-Eastern	112	—25	— 4
Rocky Mountains	120	— 1	+ 15
Pacific Coast	141	+ 6	— 23
Total United States	2,177	—32	+246
Western Canada	99	+10	+ 28
Total	2,276	—22	+274

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States and the West Texas-New Mexico and Oklahoma-Kansas areas are shown by charts on pages 172 and 173.

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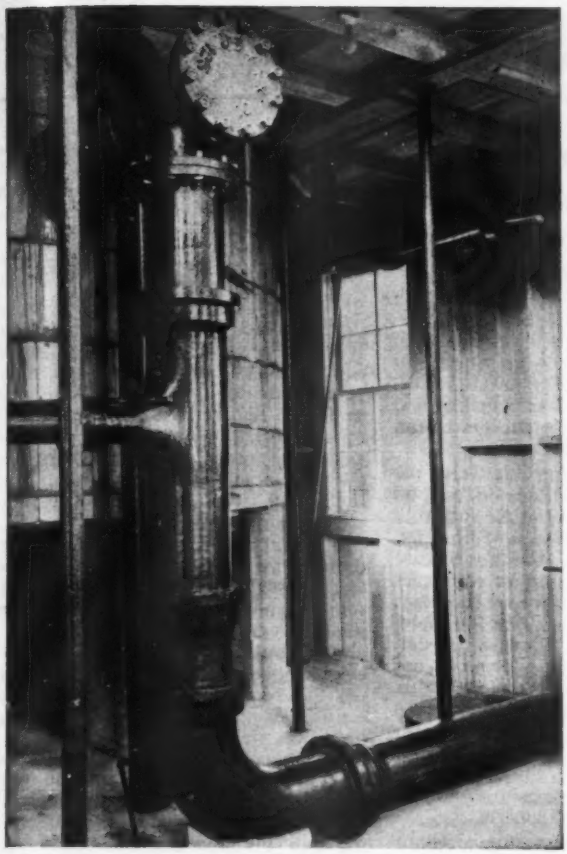

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REFINING

Refinery Record

ECA funds double capacity of Western Europe plants

WASHINGTON.—Refinery capacity in Europe lying west of the Iron Curtain has nearly doubled in capacity since the Economic Cooperation Administration began supplying funds under the Marshall plan in April 1948. This increased capacity has had a stimulating effect on the petroleum industry in Western Europe.

In the period ending last June the United States had allocated a total of $29,917,000 for rebuilding of old and construction of new refineries. The largest share went to France where $12,628,000 spent on refineries has stimulated the entire oil industry. One of the results is a new oil field, developed near the Spanish border. The success of this operation has started exploration activities in Spain.

The United Kingdom received $9,705,000, all of which was for refinery capacity in the British Isles alone, no use of the funds being permitted for overseas investment. Italy's portion was $7,580,000.

This investment was only a minor part of total expenditures with which the three powers have developed their refinery-construction program. According to ECA figures released up to July 1, refinery expansion in the three countries has involved the investment of $185,834,000.

American know-how. — Much of the U. S. dollar investment, ECA officials say, has gone for technical engineering, plans, and specifications. American personnel having the most advanced technological knowledge has been made available to increase the efficiency of the European investments.

When the ECA program started, total refinery capacity in France, Italy, and the United Kingdom was 480,000 bbl. daily. Observers with ECA now report that capacity is approaching 810.000 bbl. daily. Given 3 years to complete the program now projected, the total capacity will be 1,160,000 bbl. daily.

Refinery capacity now is estimated to approximate the prewar level, but industrial needs have increased, and propane gas has found an extensive market there. The L.P.G. market in Italy is having a rapid growth.

Some ECA money has gone toward stepping up production in known fields of Germany along the Dutch border. There the 1948 production of 12,000 bbl. daily has been increased to 22,000 bbl.

Between $2,000,000 and $3,000,000 of ECA funds were earmarked for oil exploration in southern France, in eastern France near the German border, and in North Africa.

Alkylation Unit Running

TULSA.—Mid-Continent Petroleum Corp.'s new alkylation unit at the West Tulsa refinery started its initial run last week. Rated at 800 bbl. daily of alkylate, the product will be used to absorb lighter hydrocarbons, thereby increasing the refinery's potential gasoline production. Currently the alkylate is to be utilized for motor fuels only. The unit is the type employing sulfuric acid.

Construction on the plant has been under way about 100 days. Erection work was handled by company personnel, and M. W. Kellogg Co. supplied design and engineering.

Mid-Continent's West Tulsa refinery is currently rated at 45,000 bbl. per day of crude-oil input. Initial operation of a fluid catalytic cracking unit was started in the refinery less than a year ago. In addition to the cat cracker, the refinery is equipped with 17,000 bbl. per day of thermal cracking capacity, including reforming and vis-breaking for production of motor fuels.

A polymerization plant and treating equipment round out Mid-Continent's gasoline-producing facilities at the refinery.

W.P.R.A. Meeting Set

CASPER, Wyo.—The first regional meeting to be held in Wyoming under sponsorship of Western Petroleum Refiners Association will be held here October 12-13, John C. Day, association secretary, announced last week.

The first day will be devoted to discussion of refinery labor problems and other industrial-relations matters, and on October 13 technical papers and discussion of technical problems will be presented.

Prices Raised by Ethyl

NEW YORK.—The price of "Ethyl" antiknock compounds will be increased by approximately 4½ per cent on November 1, Ethyl Corp. notified its customers last week, due to increasingly heavy demands.

The firm said that shipments of antiknock compounds during September and October "will be limited to 85 per cent of the average rate of shipments to customers during the 4-month period from April to July inclusive this year."

No limitations were placed upon

shipments of aviation mix or for motor antiknock compounds for military use.

The new price for all shipments will be 58 cents per pound of tetraethyllead content for motor mix (approximately 0.21 cents per cubic centimeter), and 63.5 cents per pound of compound for aviation mix (approximately 0.23 cents per cubic centimeter).

Ethyl Corp. blamed increased costs in production, coupled with higher military and domestic demands, for the price increase, the first change since the company reduced the price last March 10.

Bay to Expand Plant

DENVER.—Bay Petroleum Corp. will completely modernize its Chalmette, La., refinery for production of products required to meet defense needs and domestic-market demands, the firm reported here last week.

Present crude capacity of 12,000 bbl. daily will eventually be stepped up to 16,000 bbl. daily when the project is completed.

Installation of a 6,000-bbl. daily U.O.P. fluid catalytic cracking unit, and the complete revamping of existing facilities at Chalmette will enable the company to maintain its competitive position in that area, Bay reported.

The program is now under way and design details for the cracking unit are now being worked out by Universal Oil Products Co. Construction of the unit, and revamping of other facilities, will be handled by Procon, Inc., with completion set for the latter part of 1951.

Gas Oil Meets Steel Test

PITTSBURGH, Pa.—Gas oil has replaced special petroleum oils in light-oil recovery from coke-oven gas, according to C. R. Montgomery, chief chemist, By-Product Coke Division, Pittsburgh Steel Co.

For many years operators have been using a special high-boiling petroleum oil in their recovery process. This oil met rather close specifications as an absorbent oil. At Pittsburgh Steel, samples of various types of oil were tested as possible substitutes for the rather expensive absorbent oil.

By using gas oil, the results showed that recovery had not suffered, the system had remained as clean or cleaner, products retained their quality, and the company saved 4½ cents a gallon on the oil delivered.

A full report of the tests will be given at the annual convention of the Association of Iron and Steel Engineers, to be held in the Public Auditorium, Cleveland, September 26-29.

Another paper of interest to the petroleum industry will be that which will deal with what qualities hydraulic fluids now have and those they may lack for present needs. These problems will be analyzed by Anthony J. Zino, Jr., assistant sales manager of the Industrial Division, Swan-Finch Oil Corp., New York.

Comparison will be made between the usual oil specifications as written by the hydraulic-oil engineer or oil supplier, and the actual service performance characteristic or service properties required of the hydraulic fluid.

Wax Made From Shale Oil

WASHINGTON.—Paraffin waxes made from petroleum now have a substitute in waxes processed from oil shale, according to a Bureau of Mines report. The shale product is virtually identical with the petroleum wax, and could be used in the manufacture of food containers.

Cost of making a fully refined wax from shale is higher than petroleum wax when fully refined, but in the lower grades the costs are similar. Source of the shale oil is found in large shale reserves in Colorado, Wyoming, and Utah.

Bureau technologists at the Laramie, Wyo., petroleum and oil-shale experiment station and the oil-shale demonstration plant at Rifle, Colo., collaborated in producing the waxes from shale-oil distillates.

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3. After retardation, a heavy slurry of Unaflo hardens normally to form a dense, impermeable seal.

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Wyoming Operators Get a Break

WYOMING operators, long at a disadvantage because of the lack of an adequate outlet for the crude they have found, are at last getting a break. This break comes in the form of an additional pipe-line outlet to an area with a demand great enough to support accelerated exploration and development programs in the Rocky Mountain area. Five of the larger operators are responsible for this break, which will benefit not only themselves but nearly all Rocky Mountain producers, either directly or through trade arrangements made possible by this proposed outlet.

The existing pipe line out of the Rocky Mountains to the center of crude consumption, which centers in the area around the south of the Great Lakes, was constructed in 1922, a year when Wyoming's average crude production was only 73,200 bbl. daily. The following year the state's daily average production jumped to 121,000 bbl., but then declined steadily until by 1933 it produced a daily average of only 30,000 bbl. Since 1933 Wyoming's production has been increasing without a break, except for the temporary cutback of black-oil production that lowered the 1949 average.

As shown by the accompanying table, each of the five companies participating in the construction of the new pipe line is a substantial producer in Wyoming. Ohio Oil Co. and British-American Oil Producing Co. are in the process of developing additional production in southwestern Nebraska and northeastern Colorado near the route of the proposed line. The Sussex-Meadow Creek area fields in which Continental Oil Co. has a major interest, are being developed rapidly and indicate tremendous possibilities. Pure Oil Co. is operator of the big Worland unit, production from which is currently restricted to the capacity of the existing sulfur-extraction plant. In recent years Sinclair Oil & Gas Co. has had an outstandingly successful rate of barrels of oil discovered per wildcat drilled.

The entire gathering system for the new pipe line has not been established. It is theoretically ready to go where a need for it develops. It is a reported possibility that it might be extended as far south as the Rangely area of northwestern Colorado if conditions warrant.

LEADING PRODUCERS IN WYOMING

Producing company—	Bbl. per day
Sinclair*	22,000
Ohio*	21,800
Stanolind	21,500
Continental*	17,500
Argo	9,300
General	5,500
Pure*	5,200
British-American*	4,500
Texas	4,500
Carter	4,000
Trigood	3,300
Empire State	3,200
Phillips	2,200
Husky	2,100
Standard of California	2,000
Frontier	2,000
Mackinnie	1,500
Brinkerhoff	1,300
Mule Creek	1,300
Barber	1,000
Others	26,200
Total state	160,000

*Participants in Platte Pipe Line Co. pipe line from near Worland to Wood River, Ill.

The area to be serviced by the new pipe line centers in Wyoming. According to computations made by the pipe-line builders, refined products cannot be marketed competitively outside of an area which roughly includes most of Wyoming and the adjacent edges of Montana, Nebraska, and Colorado. Outside of this restricted area a marketing company must absorb transportation costs and therefore cannot compete with facilities more advantageously located.

Production in Wyoming and in portions of other Rocky Mountain states is expected to have a marked increase as soon as the new pipe line is opened. Although there is not sufficient shut-in production to fill the pipe line at the present time, the immediate future should see development of proved reserves, and the discovery and development of new reserves to such an extent that the line will soon be running at maximum capacity.

The potential oil-producing territory in the Rocky Mountains has barely been scratched by Mid-Continent standards. Proved remaining reserves in Wyoming are estimated to be in excess of 700,000,000 bbl., about 12 years of supply at the present rate of production. The number of barrels of oil discovered during the past 9 years is estimated to have been nearly half again as much as has been produced during the same period.

Philip C. Ingalls

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST TEXAS.—Offsets to the O'Donnell field reef discovery, Lynn County, have had poor shows on preliminary tests in the Pennsylvanian, but Humble 1 Dulin, northwest offset to the discovery well, had prospects of Mississippian production. A drill-stem test at 9,034-74 ft. yielded 2,700 ft. of gas in drill pipe, plus oil and gas-cut mud. Honolulu 1 Emmons, east offset to the Ropes discovery of Hockley County, was reported about 50 ft. low on the reef section, to the discovery, but made a flow of 88 bbl. of oil in 5 hours from reef pay at 9,300-55 ft.

SOUTHWEST TEXAS.—Producers Corp. of Nevada 1 Helen Williams et al., William C. Hargis Survey, Abstract 273, Gonzales County, recovered 4,000 ft. of 24.8°-gravity oil through perforations in the Georgetown lime at 5,801-5,916 ft., which is believed will open a whole new producing trend in this area.

ROCKY MOUNTAIN AREA.—Shell Oil Co.'s wildcat in the Buckingham area, Colorado, flowed oil on drill-stem test from the Muddy sand this week. Sinclair Oil & Gas Co. completed a new pay discovery at its Happy Springs field, Wyoming. Atkinson-Lavington made a gas discovery on the west side of the Denver Basin, Colorado.

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This is a photomicrograph (450X) of an "oil in water" emulsion containing 1% oil.

New applications are being found almost daily for oil emulsion drilling muds, and it is the dispersing of the oil in the form of stable tiny globules which is responsible for the improved performance records. Jel-Oil "E" is an easy-to-use, ready-mixed oil compound which is added to conventional water base mud to give a stable oil emulsion mud. Reports on its use show increased drilling rate in most formations, longer bit life and fewer trips, reduction of rotating torque and hole friction, and completion of better wells. So get the most out of the oil which you add to your mud. Field experience indicates that you can expect twice the effectiveness from a given oil content in the mud when Jel-Oil "E" is used. Ask your Magcobar dealer or field engineer for more facts on how Jel-Oil "E" makes oil in the mud work for you!

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Texas Gulf Coast

Three New Sands Seen In New Ulm Field

HOUSTON.—Apparently three new sands are being opened in the multiple-pay New Ulm field of Austin County. New Ulm Corp. is dually completing its B-1 P. L. Meadors, et al, Adam Duykendall Survey, Abstract 243, at 9,432-54 ft. and 10,054-82 ft. Through upper perforations on potential test, the well flowed 252 bbl. of 41°-gravity oil per day through an 11/64-in. choke. On initial test of the lower sand the flow was 18 bbl. of oil and wash water per hour through a ¼-in. choke. Tubing pressure was 1,000 psi. and casing pressure 675 psi.

Meanwhile, the same firm has dually completed its 1 C. J. Marik, et al, as a new gas-condensate well for the field. On an open flow test of the casing sand at 9,761-73 ft., the well flowed 25,000,000 cu. ft. of gas. Shut-in pressure was 2,950 psi. On an open-flow test of the tubing sand at 10,074-89 ft., the flow was 15,200,000 cu. ft. of gas plus 56 bbl. of condensate per 1,000,000 cu. ft. of gas. This well is a northwest extension to the field.

Efforts to find flank oil production on the west side of the San Felipe dome in southeastern Austin County failed the past week. Magnolia Petroleum Co. 2 Joe Vitek, S. F. Austin League, Abstract 7, was pulling 7-in. pipe after recovering 2,000 ft. of salt and sulfur water on drill-stem test from 4,655-65 ft. Total depth is 9,303 ft.

Brazos Oil & Gas Co. 1 State of Texas "O" (Lease M-30,064), wildcat test 4 miles south of Palacios in Matagorda Bay, is shut in waiting on potential test. On a 10-hour test, the well flowed 38 bbl. of 31°-gravity oil plus 11 bbl. of salt water, through perforations at 5,163-65 ft. The new discovery is located in State Tract 302 of Matagorda Bay.

Also in Matagorda Bay, Brazos has spudded in on its 1 State of Texas "V," (Lease M-30-070), State Tract 308.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Austin County: New pay at New Ulm—Oil Drilling, Inc. 1 Selma Holzman, A. Kuykendall Sur., 2 mi. E of New Ulm townsite, dual completion, casing perf. 9,438-47 ft., top pay 9,438 ft., IP: 206 bbl. oil per day, 10/64-in. choke, CP 1,025 psi., 40° grav., no potential on tubing perforations at 9,638-55 ft., TD 10,111 ft.

DeWitt County: Gas discovery—Deep Rock Oil Co. 1 Edwin Nagel, Mumford House Sur., A-226, TD 8,717 ft., perf. 7,675-95 ft., IP: no gage, shut in, BHFP 1,020 psi., BHPSI 3,235 psi.

Galveston County: New pay at Hitchcock—Stewart Petroleum Co. 2 State-Highland Bayou, State Lands, surf. location, John D. Moore Lge., TD 6,800 ft., top pay 5,301 ft., perf. 5,304-10 ft., IP: 40 bbl. oil per day, ½-in. choke, 36.4° grav., TP 1,850 psi., CP 800 psi.

Goliad County: New pay at Berclair—Magnolia Petroleum Co. 1 John P. Forrest, Sampson McTornall Sur., 1¾ mi. SW of Berclair field, TD 3,350 ft., perf. 2,781-89 ft., IP: 1,625,000 cu. ft. of gas per day on open flow, SIP 1,127 psi.

Jackson County: Gas discovery—Big Six Drilling Co. 1 Biship Briffin, Tacitus Clay Sur., A-14, 3 mi. SW of Cordelle field, 10 mi. NW of Edna, TD 3,007 ft., top pay 2,417 ft., perf. 2,417-21 ft., IP: 49,000,000 cu. ft. of gas per day on open flow, SIP 1,077 psi.

Oil discovery, "Wajack"—Gulf South Oil Corp. 1 William Niebuhr, et al, T. M. Dorsett Sur., 1 mi. NE of Little Kentucky field, TD 6,215 ft., top pay 5,736 ft., perf. 5,736-40 ft., IP: 103 bbl. per day, ½-in. choke, 33.8° grav., TP 690 psi., CP 1,075 psi.

Gas discovery: Fred W. Shield 1 Laughter, James Kerr Sur., Collier area, A-39, 6 mi. NW of Edna, TD 4,007 ft., top pay 3,990 ft., perf. 3,992-4,002 ft., IP: 13,500,000 cu. ft. of gas per day open flow, SIP 1,640 psi.

Victoria County: New pay at East McFaddin—Union Producing Co., et al, A-20 McFaddin, et al, C. O. Edwards Sur., A-526, top pay 5,643 ft., TD 6,015 ft., Perf. 5,643-47 ft., IP: 152 bbl. oil per day, ½-in. choke, 38.6° grav., TP 925 psi., CP 1,125 psi.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Bee County: Chamberlain, Fisher & Presnall 1 Mrs. Josephine Chessnutt, Dominique Toole Sur., A-1,237, 4 mi. SW of Blanconia field, dry, TD 5,520 ft.

Brazoria County: Earl C. Hankamer 1 Second National Bank, J. W. Hall League, A-67, dry, TD 9,518 ft.

Sam G. Harrison 1 Houston Farms Development Co., Perry and Austin Lge., A-109, SW Alta Loma, dry, TD 7,107 ft.

Brazos County: S. W. Breeding & M. H. Stone 1 K. T. Williams, Evans and Millican Sur., 2½ mi. NE of Millican, dry, TD 6,570 ft.

Goliad County: Kirby Petroleum Co. 1 Charles Gleinser, et al, Squire Burns Sur., A-70, 1 mi. E of Weser townsite, dry, TD 5,613 ft.

Hardin County: Wm. Herbert Hunt Trust Est. 1 Nona Mills Co., Walton Hill Sur., A-634, 8 mi. SE of Kountze, dry, TD 9,243 ft.

Jefferson County: Crown Central Petroleum Corp. 2 J. E. French Est., W. Dyches Sur., A-17, NW of Beaumont, dry, TD 7,523 ft.

Lee County: L. M. Lockhart 1 Oscar Brown, Robert Finney Sur., 6 mi. N of Lexington, dry, TD 5,910 ft.

Live Oak County: George W. Graham, et al, 1 Louis Lupe, William Cairus Sur. 174, A-232, 12 mi. E-NE of Whitsett, dry, TD 7,501 ft.

Polk County: Dr. S. H. Bergman 1 I. R. Phillips, John T. Pinchney Sur., A-63, N of Goodrich, dry, TD 3,712 ft.

Tyler County: C. N. Housh & American Republics Corp. 1 J. T. Read, William Phillips Sur., A-516, ½ mi. N of E. Hillister, dry, TD 7,444 ft.

Walker County: L. M. York & Moran Oil Corp. 1 Randolph-Bily, C. A. Sleigh Sur., A-496, NW of New Waverly, dry, TD 4,130 ft.

Wharton County: T. K. Campbell 1 Gulf, S. F. Austin 3-1/6 Lge., Boling dome, dry, TD 406 ft.

Mississippi

Adams County Wildcat Still Attempting Completion

JACKSON.—An attempt is still being made by Danciger Oil & Refining Co. and William Helis to complete their Adams County wildcat, the 2 George Armstrong, 20-5n-2w, Adams County, Mississippi. A series of squeeze jobs over the past few weeks has failed to permit recovery of any more than some oil shows. A drill-stem test through perforations at 6,346-39 ft. had resulted in recovery of water cushion, mud, and a show of gas. The wildcat is located between South La Grange and Armstrong fields. The sand under test is the Wilcox.

Union Producing Co. and Jones O'Brien are rigging up for a wildcat 1 mile west of production in Tinsley field, Yazoo County, Mississippi. It is the 1 Logan, 23-10n-3w, and will be drilled to 12,500 ft. to test the Smackover lime.

Kemp Drilling Co. and Petersen Drilling Co. had a dry hole in their 1 Annie T. Finter et al, 20-5n-1w, 5 miles east of Kingston field, Adams County, Mississippi. Some shows were encountered at 6,632 ft. and at 6,697-6,700 ft.

Carter Oil Co. 1 Wilson-Wilburn Unit, NW SE 30-12n-3e, Pickens field, Yazoo County, Mississippi, was dry. Hole had been

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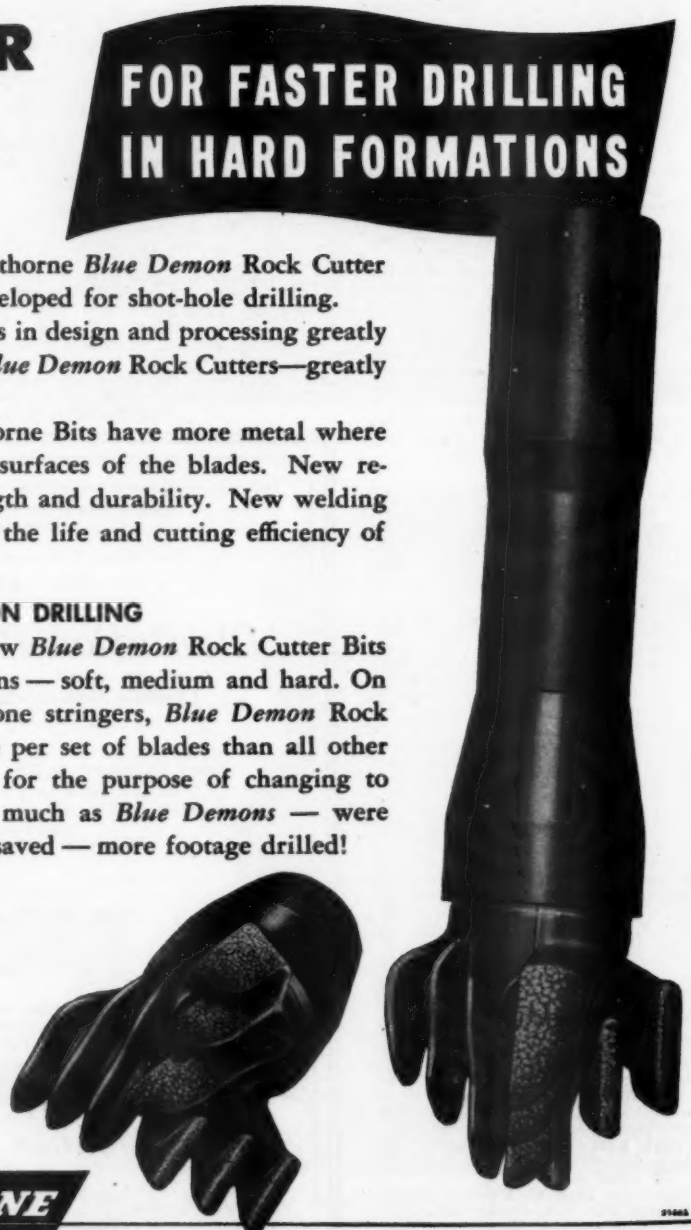
Comparative tests prove that the new *Blue Demon* Rock Cutter Bits efficiently drill 90% of all formations — soft, medium and hard. On tests in hard sandstone and limestone stringers, *Blue Demon* Rock Cutters drilled 36.2% more footage per set of blades than all other bits tested. Moreover, round trips for the purpose of changing to roller bits — costing six times as much as *Blue Demons* — were eliminated. Time and money were saved — more footage drilled!

You owe it to yourself to check the important savings and increased production now available to you with Hawthorne *Blue Demon* Rock Cutter Bits. These new *Blue Demon* Bits fit the standard Hawthorne assemblies and sell at the same prices as the Rock Cutter Bits listed in Geophysical Directory and Composite Catalog.



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P. O. BOX 365 HOUSTON 6, TEXAS

plugged back to 6,127 ft. from total depth of 7,979 ft. to test oil shows in Lower Tuscaloosa sand. Recovery from 15-minute drill-stem test was a muddy salt water with only a scum of oil. Well is northeast offset to Lower Cretaceous discovery for the field.

Danciger Oil & Refining Co. is still coring at its 1 John F. York, NE SE 1-7n-1w, Clarke County, Alabama. Latest reports indicate continuous coring from 11,617 to 12,020 ft.

MISSISSIPPI WILDCAT FAILURES

Adams County: Danciger-William Helis 2 George Armstrong, 20-5n-2w, dry, TD 6,760 ft.

Kemp Drilling Co. and Petersen Drilling Co. 1 Annie T. Minter, et al, 20-5n-1w, dry, TD 7,008 ft.

Scott County: A. M. Keisker 1 E. E. & I. S. Seiler, 33-6n-9e, dry, TD 8,814 ft.

Wilkinson County: D. C. Latimer-H. C. Lewis 1 Walter Cavin, 44-4n-1w, dry, TD 7,010 ft.

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Southwest Texas

Another Discovery Recorded In Gonzales County

CORPUS CHRISTI.—Another new discovery which may open a whole new producing trend in South Texas has been indicated at Producers Corp. of Nevada 1 Helen Williams, et al, Wm. C. Hargis Survey, Abstract 273, Gonzales County. On drill-stem test at 5,80-916 ft. in the Georgetown lime, recovery was 1,900 ft. of mud and 4,000 ft. of 24.8°-gravity oil. The well flowed in 21 minutes, with 300-psi. working pressure in 25 minutes. Pressure was still rising when the tool was closed. This is the most important discovery in years on the Edwards lime trend, which immediately underlies the Georgetown lime. Operators cored ahead to the Edwards lime to total depth of 5,934 ft., finding some porosity in cores of that section, and are now preparing to drill-stem test.

Siznod Oil Corp. 1 M. L. Girard, new oilfield discovery in LaSalle County, 2 miles southwest of Cotulla, is rigging up pump for completion after swabbing 31.7°-gravity oil at the rate of 3 to 4 bbl. per hour. The hole was drilled to a total depth of 6,511 ft. and plugged back to 5,510 ft. Operators set 5½-in. casing at 5,480 ft. on 30 ft. of Escondido sand for completion through open hole at 5,480-5,510 ft. This discovery, which locates in Section 7, Robert Crawford Survey, Abstract 1,133, is of unusual importance in that it is a southwestward extension of the Navarro production trend which lies through the Charlotte and W. Charlotte areas of Atascosa and Frio counties.

A new shallow Serpentine plug discovery has been indicated at Anderson-Prichard Oil Corp. 1 Joe A. Martin Estate, Michael Green Survey, Travis County. Hole was drilled to a depth of 815 ft. and has 5-in. pipe set on bottom for completion. Drill-stem test run at 720-40 ft. recovered only mud. Operators cored to 815 ft. and recovered Serpentine with oil shows and good saturation to 769 ft.

George W. Graham, et al, 1 Lester Moore, in the Amargosa area of Jim Wells County, has indicated new pay zones for the field below the regular producing sand. The well tested oil at 4,997-5,003½ ft. in the regular field pay. Test made in a lower sand at 5,749½-55 ft. recovered 100 ft. of gas-cut mud with some straw-colored condensate. Bottom-hole pressure was 2,900 and 3,100 psi. Hole was then drilled to total depth of 7,000 ft. where electric log was run and side-wall samples taken. Another new zone for the field was indicated in 9 ft. of saturated oil sand on side-wall samples at the 5,200-ft. level, and another around 6,000 ft. also showed producing possibilities. Pettus was topped at 5,748 ft.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS

Dimmit County: Oil discovery, "Rocky Creek"—J. C. McCabe, et al, 1 Mayflower Investment Co., Sur. 667, 6 mi. NW of Carrizo Springs, top pay 2,114 ft., TD 3,015 ft., perf. 2,114-24 ft., IP: 59 bbl. oil per day, on pump, 29° grav.

Duval County: New pay on Palangana dome—Crescent Oil Co. 1 Cain & Smith, GH&H Sur. 81, A-249, top pay 444 ft., open hole 444-52 ft., IP: 25 bbl. oil per day on pump.

McMullen County: Gas-condensate discovery—Delhi Oil Corp. 1 Lula W. Pursch, et al, BS&F Sur. 116, A-1,604, 12 mi. NE of Freer, TD 8,009 ft., perf. 7,165-90 ft., IP: 25 bbl. condensate per day plus 15,000,000 cu. ft. of gas (estimated), comp. and shut in.

Nueces County: Gas-distillate discovery—Shell Oil Co. 1 State Tract 342, Red Fish Bay, 4 mi. SE of Ingleside, TD 9,803 ft., top pay 7,624 ft., perf. 7,629-40 ft., IP: 53 bbl. condensate per day on 5/16-in choke, or 5,800,000 cu. ft. gas per day open flow, TP 1,560 psi., 53.8° grav.

Starr County: Gas discovery—Hugh Kirk-

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patrick et al., 1 Eduviges Alvarez, Santa Teresa Grant, 1½ m. N of San Yzidro, TD 6,033 ft., top pay 4,590 ft., perf. 4,590-625 ft., IP: 20,000,000 cu. ft. of gas per day, open flow.

Webb County: Oil discovery—O. W. Killam 2 Floyd Billings, CCSD&RGNG RR Sur. 38, 16 mi. N of Bruni, 5 mi. NE of Carolina-Texas field, TD 2,405 ft., top pay 2,389 ft., perf. 2,393-405 ft., IP: 64 bbl. oil per day, 5/16-in. choke, TP O, CP 840 psi., 31.9° grav.

Gas discovery—Magnolia Petroleum Co. 1 Lopez Estate, T&NORR Sur. 139, TD 6,706 ft., PBTD 2,560 ft., perf. 1,409-18 ft., IP: 8,400,000 cu. ft. of gas per day, open flow, SITP 48 psi.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Duval County: J. B. Blanchard 1 Farmers Life Insurance Co., J. Poitevent Sur. 325, 17½ mi. NW of San Diego, dry, TD 3,706 ft.

Humble Oil & Refining Co. A-63 V. Kohler, J. Poitevent Sur. 163, 18 mi. SW of Freer, dry, TD 4,000 ft.

Milam County: Roland B. Paxson, et al, 1 Carl C. Black, L. Lomas Sur., 6 mi. NE of Camerson, dry, TD 1,735 ft.

Nueces County: Ginther, Warren & Ginther 1 Hilda P. Wagner, Block 53, George H. Paul Subd. of Driscoll Ranch, 2¼ mi. E-NE of Banquete, dry, TD 7,520 ft.

Michigan

Gladwin County Test Scheduled for Completion

MOUNT PLEASANT.—H. E. Bell 1 Serlin & Kaminsky, NE NE SW 12-20n-1w, Butman Township, Gladwin County, flowed wild from the Traverse early this week but had been brought into control and was scheduled to be tested and probably completed in the Traverse. This well, in Butman Richfield oil pool, and the south 40-acre offset to a Richfield producer, was originally scheduled to be completed in the deeper zone.

It was first announced, even after the Traverse oil was found, that well would be carried to the Richfield due to previous lease requirements, but this situation had been revised at this writing.

Traverse lime (Squaw Bay) was logged at 2,780 ft. Pay showed at 2,790-91 ft. and on drill-stem test, with packer set at 2,770 ft., hole carried 600 ft. of free oil in an hour and free gas in 4 minutes. After this test, well blew in wild and it took 14 tons of Baroid to bring the flow into control. A string of 7-in. casing was cemented at 2,776 ft. prior to cleanout and further tests. About 190 bbl. of oil was recovered from pits at midweek.

This is the first well in the Butman field-development program, which includes one Dundee oil well, two Richfield oil producers, and several dry holes, where oil has been encountered in flowing quantities in the Traverse.

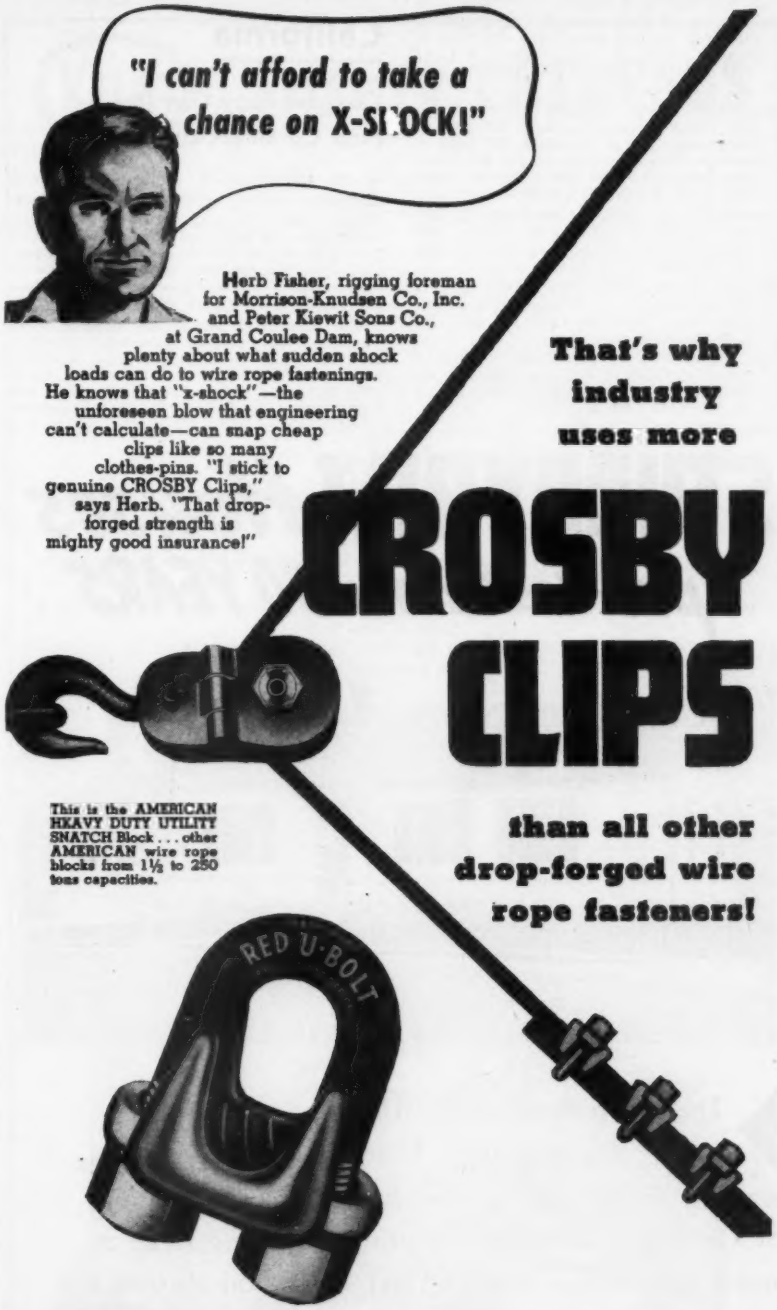
Cities Service Oil Co. failed to drill a Traverse oil pay at the 1 O'Hara, SE SW SE 17-14n-4w, Union Township, Isabella County, north 20-acre offset to Rand & Colin's 1 Albar, Union field Traverse discovery. The Cities Service test was being rotary drilled ahead towards the Dundee this week. Traverse lime top was logged at 3,114 ft. and Alpena Travers, potential pay zone, came in at 3,197 ft., some 25 ft. lower than the offset discovery. Well showed 90 ft. of salt water and a rainbow oil show at 3,229 ft. on drill-stem test.

MICHIGAN WILDCAT FAILURES

Allegan County, Allegan Township: P. K. Degenther 1 U. S. A., NE NW SW 31-2n-13w, Traverse 1,365 ft., dry, TD 1,386 ft.

Casco Township: Louis Zellman 1 McCreery-Snider, NE NE SE 6-1n-16w, Traverse 1,168 ft., dry, TD 1,188 ft.

Mecosta County, Aetna Township: W. H.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Strickler 1 Benson & Pruetz, C NW 3-13n-10w, Stray 1,206 ft., dry, TD 1,218 ft.

Mecosta Township: Louis Rose 1 Lane, NW NW NW 26-14n-10w, Monroe 3,405 ft., dry, TD 3,540 ft.

Missaukee County, Caldwell Township: Sun Oil Co. A-1 State-Caldwell, NE SW SE 19-23n-8w, dry in Richfield, TD 5,138 ft.

Norwich Township: Sun Oil Co. B-1 Fahrney Estate, NW SE NW 5-24n-6w, Traverse 2,732 ft., dry, TD 2,960 ft.

Oceana County, Benona Township: E. Edwin Brehm 1 O'Brien & Cation, NW NE NW 8-14n-18w, Monroe 2,398 ft., dry, TD 3,150 ft.

Ottawa County, Olive Township: Wm. C. Vandenberg, Jr. 1 Koeman, SE SE SE 26-6n-15w, Traverse 1,607 ft., dry, TD 1,723 ft.

Van Buren County, Columbia Township: Stuart L. Godfrey 1 Leady-Page & Plase Est., SE SE NE 20-1s-15w, Traverse 1,150 ft., dry, TD 1,260 ft.

California

Oregon May Get Its First Commercial Producer

LOS ANGELES.—A wildcat under way just a few miles above the California-Oregon state line may result in giving the latter state its first commercial oil production. Officials of Tri-State Gas & Petroleum Co., Ltd., the operator, declined to discuss the extent of oil shows other than to state the propepector might make a well.

The wildcat, 1 Fisher, is located about 9½ miles southwest of Lakeview, or about 10 miles from the California line. A cable-tool operation, hole had been carried to 1,211 ft. where a 7-in. string reportedly was set to shut off water. Plug was scheduled to be drilled out the first of this week. The company, headquartered in Eugene, Ore., holds substantial acreage in the area.

In California fields, extensions appeared to be the order of the week. Rio Bravo field, 15 miles southwest of Bakersfield in Kern County, was given a 660-ft. southwest extension by Stansbury, Inc., 1 Wright. The new 750-bbl. producer was bottomed at 11,530 ft. after drilling 34 ft. into the oil sand.

At Fruitvale, 1 mile west of Bakersfield, Campbell-Shell & Collins 1 Stockdale-K.C.L. may give that field a ½-mile south extension. Drilled to 4,395 ft. after topping the Kernco sand at 4,109 ft., on tests the well first flowed oil for 2 hours. It then started making almost all water but at last reports the water cut had been reduced to about 80 per cent.

In Ventura Avenue field of coastal California, Shell Oil Co. 1 Shell-G. P. Fraser flowed at the rate of 690 bbl. daily during drill-stem tests to give that field a north extension. In South Cuyama field, Santa Barbara County, an outpost being drilled by Wilshire Oil Co. gave promise of extending productive limits two locations southeast. A 20-ft. core in this well, 77-6 A. H. Heller, at 4,801-21 ft. showed 14½ ft. of oil sand. Hole was being carried deeper at last report.

Southeast of this possible extensioner about 2 miles, Universal Consolidated Oil Co. has staked location for its 21-16 Pickrell. Site is in NW NW 16-9n-26w, in an area held by Universal, Richfield, Wilshire, Signal, Bell Petroleum Co., Rothschild, and others. It will be a Dibblee sand test and is to be spudded about September 15.

Area of most concentrated wildcatting activity is near Ozena in the rugged country of central west Ventura County, or about 25 miles southeast of South Cuyama. There Richfield is drilling below 2,210 ft. at its 2 Apache Unit in Section 30-8n-23w; Cal-Nevada Oil Co. is reported rigging up its 1 Behr in Section 22-7n-23w; Standard Oil Co. of California is building roads to its 1 Hattie Russell, to be drilled from an elevation of about 6,800 ft. in Section 11-6n-23w; and Superior Oil Co. has staked location for 65-20 Smith in Section 20-7n-23w. Relatively few wildcats have been drilled in this area, and aside from Richfield 1 Apache Unit which was carried to 10,563 ft., all were shallower than 4,600 ft.

In North Cuyama's Morales field, the Clayton zone was given two setbacks on the southern end. Richfield 71-15, ¼ mile southeast of production, was dry at 2,347 ft. An equal distance west of the southernmost producer, Bishop Oil Co. 67-10 Chorum, General Petroleum Corp. 47-10 Whitney was dry at 2,217 ft.

CALIFORNIA UNSUCCESSFUL WILDCATS

Kern County, Belgian anticline area: Pacific Western Oil Corp. 21-31 MM-TWA, 31-20s-22e, dry, TD 5,979 ft., elev. 1,580 ft.

Tejon Hills area: C. E. Zilgitt 1 K, 14-11n-18w, dry, TD 1,266 ft., elev. 1,160 ft.

San Luis Obispo County, Morales area: Richfield Oil Corp. 71-15 Schaudeman-D, 15-11n-28w, dry, TD 2,347 ft., elev. 2,204 ft.

General Petroleum Corp. 47-10 Whitney, 10-11n-28w, dry, TD 2,217 ft. ,elev. 2,042 ft.

Santa Barbara County, Cuyama Valley area: Richfield Oil Corp. 65-9 Russell-A, 9-10n-27w, dry, TD 4,150 ft., elev. 2,090 ft.

Mohawk Petroleum Corp. 48-2 Humble-Lundstrom, 2-9n-26w, dry, oil-sand streaks at 11,065-72 ft., TD 11,175 ft., elev. 2,500 ft.

Ventura County: Tar Creek area: Zuni Oil Co. 2 Zuni-Tar Creek, 28-5n-19w, dry, TD 502 ft., elev. 2,920 ft.

Wiley Canyon area: R. B. Watkins 1 Dolley, 6-3n-18w, dry, TD 2,670 ft., elev. 1,407 ft.

CALIFORNIA SUCCESSFUL WILDCAT

San Benito County, Sargent area: Jack Herley, Opr. 1 O'Connell, 4-12s-4e, completed pumping 50 bbl. daily 23.2°-grav. crude, 1 per cent cut. through perforations at 1,937-2,106 ft., TD 2,836 ft., 7-in. casing cemented at 2,106 ft. to which depth hole was plugged back, elev. 421 ft. New field discovery.

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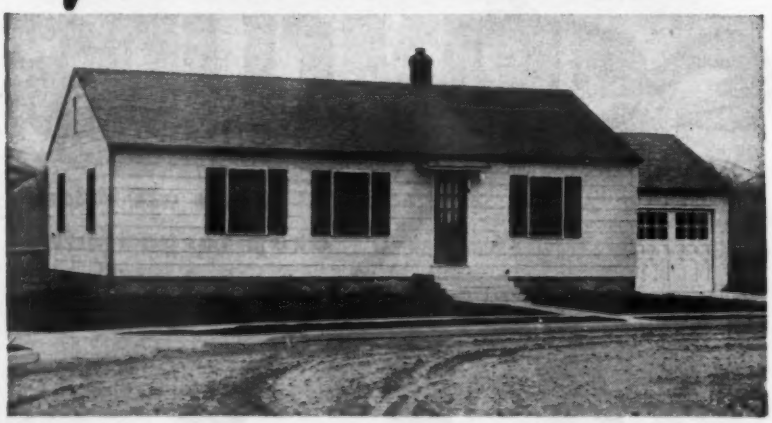

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Permian Basin

Second Pay in Prospect For O'Donnell Field

MIDLAND.—Humble Oil & Refining Co. 1 W. C. Dulin, northwest offset to Magnolia Petroleum Co.'s Pennsylvanian reef limestone discovery of O'Donnell field in southeastern Lynn County, reported prospects of a second pay in the Mississippian.

The drill-stem test, tentatively identified as Mississippian, was from 9,034-70 ft., 4 ft. off bottom. In 60 minutes recovery was 180 ft. of oil-cut mud and 210 ft. of heavily oil and gas-cut mud, under flowing pressure of 200 psi. Operators were coring ahead below 9,074 ft. Previous tests at 8,932-65 ft. recovered gas-cut muddy salt water, and at 9,020-38 ft., 100 ft. of gas, plus salt water and mud. Formation tops were: Spraberry 5,961 ft., Canyon reef 8,400 ft., and a lime stringer at 8,670 ft. Location is near SE NW 431-9-ELRR.

Magnolia Petroleum Co. 1 W. W. Caswell, NE NE Section 431, and a west offset of the O'Donnell discovery, was drilling below 8,850 ft. following a drill-stem test from 8,698-8,727 ft. which yielded 450 ft. of salty mud and some 4,000 ft. of salt water. On elevation of 2,920 ft., top of the Spraberry was 5,943 ft., and the second Pennsylvanian limestone at 8,674 ft.

In Hockley County, Honolulu Oil Corp. and Signal Oil & Gas Co. 1 J. E. Emmons, east offset to Ropes Canyon field, was assured good production as the field's third completion. Casing was set at 9,339 ft., and after drilling plug, a drill-stem test in open hole to 9,355 ft., total depth, had gas in 11 minutes and oil in 1 hour and 40 minutes. During the following 5 hours the well flowed a total of 88 bbl. of oil, through ⅛-in. choke. It was to be cored deeper.

Standard-Fryer and R. L. York 1 Justice Heirs, Garza County wildcat in 19-6-H&GN, about 2 miles southeast of Justiceburg, was running electrical surveys following a drill-stem test in the Strawn limestone at 7,460-92 ft. The test was open 2 hours. Gas came to the top in 6 minutes and after pulling 10 stands of pipe, the well unloaded oil for 25 minutes. Five dry stands had been pulled when the well started unloading again, for 30 minutes; then the remainder of pipe unloaded intermittently while coming out. The bottom 10 stands had salt water. Recovery was estimated at 4,870 ft. of oil and 1,430 ft. of salt water.

In Midland County, Humble 1 T. O. Midkiff, 46-38-4S-T&P, 10 miles south of Tex Harvey Spraberry field, was trying to complete as a Spraberry discovery. Total depth was 7,347 ft. in sand, topped at 7,302 ft., where 7-in. casing had been set. In 10 hours of swabbing, recovery was 33 bbl. of fluid, being 94 per cent 31.6°-gravity oil and 6 per cent water.

Three miles south of the Parks discovery, Magnolia 1 H. F. Timmerman, NE NE 8-40-3S-T&P, topped the Wolfcamp at 9,205 ft., said to be some 6 ft. high to the 2 Roy Parks. Operators set 7-in. casing on bottom, then perforated at 7,150 ft. with 2 holes and squeezed 630 sacks of cement behind the pipe.

Magnolia 1 H. S. Collins, Section 7, Matt Daugherty Survey and north offset to the 2 Parks, was drill-stem testing in the Wolfcamp from 9,860-9,960 ft. The section had slight oil shows while drilling.

In northwest Howard County, Stanolind Oil & Gas Co. 1 C. W. Burton, 27-33-2N-T&P, 8 miles south and slightly west of Vealmoor field, had total depth at 6,784 ft. and was to continue drill-stem testing. A test from 6,670-6,734 ft., open 1 hour and 20 minutes, recovered 410 ft. of slightly oil-cut mud. According to report, the tool had plugged after 20 minutes. A 1-hour test from 6,660-6,784 ft. produced a strong blow of air for 15 minutes and recovered 850 ft. of mud.

In Oldham County, Texas Panhandle, J. C. Clower and others 1 Howard, 85-K6-George Baker and Charles Nancy Gray Survey, re-

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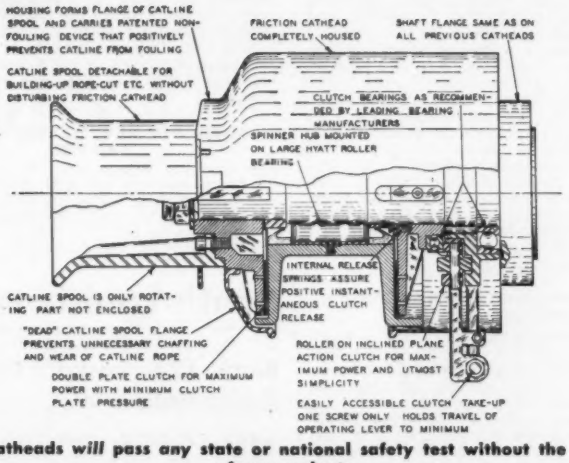
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ported a Pennsylvanian reef at 6,140 ft., by samples, and was still in the reef at 6,300 ft. Minus datum point on the reef was 1,985 ft. At last report it was in soft dolomite at 6,316 ft., with no shows and was to run a drill-stem test in the reef section. Location is about 150 miles north of nearest reef production in Hockley County.

In southwestern Terry County, Magnolia 1 Hermon Scales, NW NW 12-C36-PSL, east offset to Anderson-Prichard Oil Corp. 1 Bevers discovery, recovered mud and sulfur water on a drill-stem test at 5,191-5,300 ft. in the San Andres.

Anderson-Prichard 2 Bevers, west offset to the discovery, was drilling ahead at 7,560 ft. The same company's 3 Bevers, south offset, was drilling below 6,600 ft.

Amerada Petroleum Corp. 1 N. W. Willard, Terry County wildcat, which indicated discovery production from the Wolfcamp, had reached 11,763 ft. in lime and shale. Amerada's 2 Willard, west offset, was in lime at 8,027 ft. Amerada 1 Miller, east offset, was drilling below 7,175 ft.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCATS

Crockett County: H & F Oil Co. 1-A Shannon est., Lot 21, League 4, Archer CSL, 2 mi. E Soma Noelke field, TD 2,502 ft., PB 2,078 ft., elev. 2,525 ft., gas sand 1,832 ft., 6,000,000 cu. ft. gas daily.

Runnels County: O. W. Killam 2 J. P. Knight, Sec. 346, BBB&C Sur., 7 mi. SW Winters, TD 4,015 ft., elev. 1,700 ft., Gray sand 3,955-65 ft., 4,869,000 cu. ft. gas daily, ½-in. choke, CP 1,175 psi., TP 970 psi.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Coke County: Warren Oil Co. 1 Hendry unit, 660 ft. from NE and SE lines, Hoel Holleman Sur. 305, dry, TD 5,517 ft., elev. 1,975 ft., Cisco reef 3,700 ft., Home Creek 4,000 ft., Capps 4,810 ft.

Kent County: Stanolind Oil & Gas Co. and T. N. Law 1-B G. T. Hall, SW SW 18-7-H&GN, 6½ mi. NW Salt Creek field, dry, TD 7,785 ft., elev. 2,172 ft., San Andres 2,180 ft., unidentified lime 6,725 ft., Ellenburger 7,760 ft.

Spartan Drilling Co. and others 1-116 J. W. Young, NE NE 116-G-W&NW, 7½ mi. W. Clairemont, dry, TD 7,295 ft., elev. 2,157 ft., reef 6,622 ft., Mississippian 7,260 ft.

King County: Ard Drilling Co. 4 R. B. Masterson "W," SW NW 69-A-J. B. Rector Sur., 7 mi. SE J-Y field, NE corner of county, dry, TD 6,815 ft., elev. 1,813 ft., Cisco 3,085 ft., Gunsight 3,645 ft., reef 4,920 ft., KMA 5,338 ft., Chester 6,065 ft., Ellenburger 6,560 ft.

Runnels County: Southern Minerals Corp. 2 G. F. Allen, Subd. C-3, Roma Christa Sur. 432, 4½ mi. W Ballinger, dry, TD 4,189 ft., elev. 1,705 ft., King 3,049 ft., Palo Pinto 3,509 ft., upper Capps 3,695 ft., lower Capps 3,773 ft., Caddo 4,000 ft.

Tom Green County: Shell Oil Co. 2 W. J. Johnson, SE NE Sec. 335½, Mary McMillan Sur., 4 mi. E San Angelo, 3 mi. S 1 Johnson, dry, TD 4,935 ft., elev. 1,819 ft., Strawn lime 4,714 ft.

SOUTHEAST NEW MEXICO

HOBBS.—McAlester Fuel Co. 1-A Brownfield, Lea County wildcat in NW NE 24-12s-37e, which had previously shown for possible production from the Wolfcamp and the Pennsylvanian, had flowing oil on a drill-stem test in the Devonian.

Devonian top was 11,790 ft., or minus 7,906 ft. The drill-stem test, first in the formation, was run from 11,788-11,867 ft., using 1,000 ft. of water blanket. Water blanket flowed out in 55 minutes and oil in 70 minutes, which gaged 87½ bbl. of 45°-gravity oil in 45 minutes. Size of choke was not reported. Flowing pressure was 4,400 psi. Operators circulated out, recovering oil at the rate of 116 bbl. an hour.

On elevation of 3,884 ft., tops were: Wolfcamp 9,026 ft., Pennsylvanian 9,700 ft. (?); corrected Mississippian 11,312 ft., and the Devonian at 11,790 ft.

Further drill-stem tests were reported at Amerada Petroleum Corp. 1-SA State, NW NE 35-14s-33e, 1½ miles northeast of the Saunders field discovery. At 10,000 ft., open 4 hours, gas surfaced in 8 minutes and recovery was 9,265 ft. of 39°-gravity oil, plus 630 ft. of heavily oil and gas-cut mud with some water, and 90 ft. of salt water. Flowing pressure was 965 psi. From 10,015-40 ft., recovery in 2½ hours was 5 ft. of drilling mud with no shows. The discovery, or extension, had its first oil around 9,900 ft.

Gulf Oil Corp. 1 Sams-State, 17-15s-33e, 3½ miles southwest of the Saunders discovery, was drilling in lime and shale at 13,314 ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Lea County: Wilson Oil Co. 1 Charlotte-State, SW SW SW 5-21s-34e, 2 mi. NW West Wilson field, dry, TD 4,208 ft., elev. 3,725 ft., salt 1,880-3,445 ft., Seven Rivers 3,855 ft.

South Louisiana

Block 126 Prospect Gets Confirmation Well

NEW ORLEANS.—Confirmation well for the new Block 126 prospect off St. Mary Parish in the Louisiana tidelands was reported this week by Magnolia Petroleum Co. Its State Lease 693, Well A-3, in Block 125, logged four oil sands found in the discovery well.

This well was originally drilled to a total depth of 11,962 ft. A fishing job developed at 11,400 ft., however, forcing operators to plug back to 9,500 ft. where they have started another sidetracking job. This well is an offset to the discovery well drilled by Magnolia and completed on April 15, 1950, at its State Lease 694-1-A for an initial production of 614 bbl. daily of 34.4°-gravity oil through a 12/64-in. choke from Miocene sand at 11,648-58 ft.

Glenmora field of Rapides Parish continued to dominate interest along the Wilcox trend as attention was concentrated on two offsets to the discovery well of Texas Pacific Coal & Oil Co. 1 Elliott, NW SW 35-1s-2w, major Eocene-Wilcox oil discovery in the south-central portion of the parish. East offset, its 1 J. A. Bentley, NE SW Section 35, was coring at 10,600 ft. with no information released on the lower horizons. At the north offset, Brown & Wheeler, Fort Worth, 1 W. F. Gill, SW NW Section 35 was coring at 10,691 ft. Southwest offset to the discovery, Texas Pacific 1 W. F. Gill, SE SE SE 34-1s-2w, on a 10-acre location, was drilling at 7,940 ft.

Gulf Refining Co. has been issued a permit to drill a 6,300-ft. wildcat in 13-4n-4e, Avoyelles Parish. This location is just west of the Catahoula Parish line and 2 miles south of Saline Lake field, La Salle Parish.

Richardson & Bass were conditioning mud at last reports in their deep wildcat, State Lease 1794 H-1, 4-18s-16e, Cox Bay area, Plaquemines Parish. Test has been drilled to total depth of 13,455 ft. and 9⅝-in. casing set at 10,895 ft. The firm has applied to the Conservation Department for permits to drill two offsets to the test.

Niloco Co. had a dry hole at its 1 Lutcher Moore Lumber Co. "A," which is 2½ miles west of Lucas townsite, C NE SW SE 8-8s-12w, Calcasieu Parish. Test was drilled to total depth of 7,600 ft.

Casing has been set at 11,725 ft. by Sun Oil Co. and Sohio Petroleum Co. in their wildcat 1¼ miles southeast of the Midland-field discovery well, Acadia Parish. Test is the 1 Le Blanc, 55-103-2w.

SOUTH LOUISIANA WILDCAT FAILURES

Calcasieu Paris: Niloco Co. 1 Lutcher Moore Lumber Co. "A," 8-8s-12w, 2½ mi. W of Lucas townsite, dry, TD 7,600 ft.

Lafayette Parish: Bates & Cornel and Niloco Co. 1 Lloyd Boudreaux, 32-9s-4e, approx. 4 mi. W of Lafayette, dry, TD 11,523 ft.

Canadian Fields

Two More Discoveries Reported for Alberta

CALGARY.—Two more discoveries of oil were made in Alberta during the past week, one at a wildcat around 17½ miles south of Stettler, and the other, a new oil pay zone at a well near Camrose that found oil in a higher section the previous week. During the past fortnight four separate oil discoveries have been made on the central plains of Alberta, one of which had recorded oil in two separate zones, two of which have lower potential productive horizons yet to probe, and the other which has been placed on production.

Most recent strike in Alberta was made this week in the Big Valley area, south of Stettler, and around 80 miles northeast of Calgary. The discoverer, Canadian Gulf Oil Co., received a flow of oil from D2 Devonian indicating a daily potential of 2,160 bbl. Gulf's Big Valley oil discovery well, located 17½ miles south of the major Devonian oil field it found at Stettler, drilled into 12 ft. of D2 pay zone and set casing. Hole is currently bottomed at 5,252 ft., will likely drill out cement on the week end, and proceed through D2 and look for its D3 objective.

Gulf-Big Valley No. 7 is located in LSD 7, 10-35-20w4. Gravity of the crude oil discovered is rated at 3.4° A.P.I. slightly higher than Stettler D2 crude.

Again in the limelight is Socony-Vacuum Exploration Co. 1 Flint well that last week was chalked up as a D2 Devonian oil discovery, and this week found oil in the lower D3 formation. The Flint discovery well, after opening up about 9 ft. of D3, gave an oil rise of 2,270 ft. during drill-stem test. On Friday hole was being made at 4,845 ft., about 36 ft. below top of D3, and believed still in that horizon.

The Socony well, located in LSD 13, 17-45-21w4, about 12 miles southwest of Camrose, rated oil from D2 ranging in rates from 575 to 700 bbl. daily on drill-stem tests. The D2 productive zone, about 30 to 35 ft. in thickness, gave oil with gravity around 34° A.P.I. The D3 oil was measured at 35° A.P.I.

In the Acheson-Stony Plain area, one discovery well has been placed on production, and another is heading for lower objectives. The discovery that obtained its initial production this week is California Standard Co. 1 Acheson Province, D3 Devonian producer in LSD 13, 2-53-26w4. After penetrating 121 ft. of oil pay zone, 1 Acheson went on production with an initial potential rate of 1,219 bbl. daily. The hole was completed at 5,090 ft., and did not drill to the base of D3 pay zone. Actual pay-zone thickness will likely be tested at a later follow-up driller. Gravity of the Acheson oil is 36.5° A.P.I.

About 2½ miles southwest of the Acheson oil strike, Central Leduc Oils, Ltd., struck oil in the Lower Cretaceous sands at its 1 Wild well. Hole is now bottomed in upper Devonian, and crew is looking for D2, hoping that it will be found over the week end at favorable elevation. The Cretaceous oil was found last week, when a test of a 15-ft. sand above 4,200 ft. gave a rise of 2,800 ft. of light oil and 630 ft. of salt water in 1 hour. Drilling was delayed somewhat this week due to a stuck drill pipe, but that has now been remedied. Located a mile north of Imperial-Stony Plain No. 1, the Central Leduc-Wild No. 1 well, in LSD 12, 27-52-26w4, is considered a good bet for Devonian production, and is currently making hole below 4,569 ft.

The Big Valley, Camrose, Acheson-Stony Plain oil discoveries have all indicated sizable pay thicknesses, and could result in new major oil fields for Alberta. Follow-up drilling and further extension efforts in those areas will be forthcoming in the immediate future, thus proving and disproving numerous acres of land in the vicinity of the discoveries. It is expected

that by year's end Alberta's proven and semiproven oil reserves, as a result of these recent important oil strikes, will be boosted considerably.

CANADIAN SUCCESSFUL WILDCATS

C. S.-Acheson Province 1, LSD 13, 2-53-26w4, TD 5,090 ft., I.P. 1,219 bbl. per day.

Cessford 1, LSD 3, 32-25-13w4, TD 3,740 ft. Capped as gas well.

CANADIAN UNSUCCESSFUL WILDCAT

Imperial Crossroads 1, LSD 15, 32-109-19w5, TD 4,871 ft.

Eastern Texas

Anderson County Wildcat Reports Open Hole Flow

DALLAS.—In southeastern Anderson County, E. L. Howard and Cooper-Herring Drilling Co. 1 Odell Clewis, A. Hendley Survey, 10 miles east of Slocum, reported a flow of 8 bbl. of oil an hour from the Woodbine sand topped at 5,286 ft. Five-inch casing had been set at 5,285 ft., and total depth was 5,290 ft. After drilling plug, a test on the open hole flowed at the rate of 192 bbl. of oil a day through ¼-in. choke on tubing. Flowing tubing pressure was 275 psi. Gravity of the oil was 38.5°.

The Texas Co. 1 M. T. Holmes, 2½ miles northeast of Tennessee Colony, in the same county, was drilling shale at 5,819 ft.

On the south flank of the Hainesville salt dome of Wood County, location was said to have been staked for C. S. Gainer and Hassie Hunt's deep Woodbine test, to be carried as the 1 F. E. Shamberger. Corrected location is on a 144-acre tract in the William H. Patton Survey, A-467, 660 ft. out of the southwest corner of the survey, and about 2½ miles south of the Hainesville townsite. According to reports, the well will be drilled to 10,500 ft., with Hunt company tools. The site is on acreage farmed out from Magnolia Petroleum Co.

New location has been staked for W. H. Neel 1 Eddie DeFriend, 6,400-ft. wildcat 1½ miles southwest of Joaquin, J. P. Davis Survey, A-163, in Shelby County. The site is on a 150-acre tract, and is 1,240 ft. from west and 3,800 ft. from south lines of the survey.

Testing continued at Thomas D. Humphrey 2 N. E. Tharp, D. Cervantes Survey, A-79, Kaufman County test 4 miles southeast of Kemp and 1½ miles northeast of Ham Gossett field. Total depth was 6,700 ft., and perforations in the Woodbine sand had been squeezed. New perforations were made in the Bacon limestone from 6,118-26 and 6,140-52 ft., which yielded 45 bbl. of oil in 6 hours on the swab. Fluid level stood at 3,000 ft.

At last report, rig had been skidded from the 2 Tharp to the 1 Tharp, 30 ft. west. Work on the 1 Tharp was halted at 3,648 ft., total depth, and 7-in. casing set on bottom. The well had shown for commercial production in the Woodbine sand at 3,610-18 ft., and operators drilled the second hole to the lower formation to fulfill contract obligations rather than risk possible damage to the Woodbine section.

EAST TEXAS (DISTRICTS 5, 6, AND 6-P) SUCCESSFUL WILDCAT

Grayson County: A. O. Phillips and Texas Co. 1 F. W. Reast, 660 ft. from E, 1,500 ft. from N lines, E. L. Stickney Sur., 1 mi. S Sandusky, NW corner of county, TD 7,852 ft., completed from Elleburger open hole 7,740-7,852 ft., flowed 187 bbl. of 43°-gravity oil a day, ¼-in. choke, GOR 1,200 cu. ft., CP 2,000-750 psi., TP 225-325 psi.

EAST TEXAS (DISTRICTS 5, 6 AND 6-P) WILDCAT FAILURES

Denton County: Kenro Oil Co. 1 Aisley Martin, J. Stewart Sur., A-1199, 5 mi. NW Bolivar, dry, TD 1,803 ft.

Freestone County: B. G. Byers and R. L. Peveto 1 T. B. Poindexter, J. W. Calowell Sur., 12 mi. NW Fairfield, dry, TD 4,005 ft.

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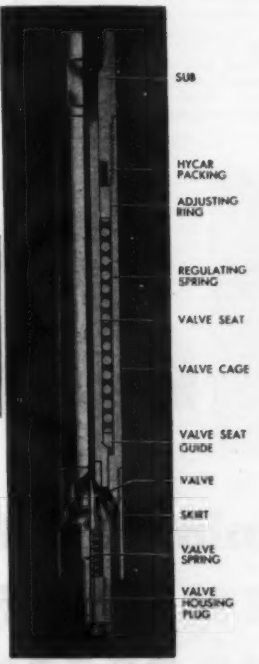

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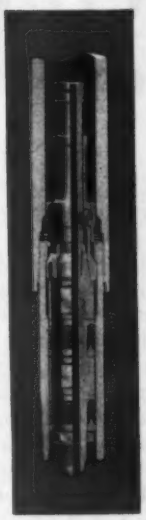
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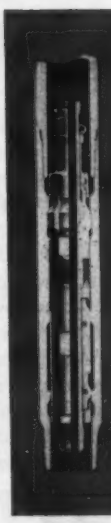
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Appalachian Field

Twenty-Nine Wells Under Way Over Wide Area

PITTSBURGH.—In the Leidy Township, Clinton County area, Pennsylvania, 29 wells are under way over a wide area—15 drilling, 6 rigs, and 8 locations. In Southwest Pennsylvania, Westmoreland County, Peoples Natural Gas Co. 1-3921 Fred Musnug, elevation 2,100 ft., is drilling at 5,451 ft. and in Napier Township, Bedford County, South Penn et al-Snee & Eberly 1 Jesse B. Miller, elevation 1,666 ft., is drilling at 7,640 ft.

Five new locations in Southwest Pennsylvania were reported during the past week: East Franklin, South Buffalo, and Wayne townships, Armstrong County; Winfield Township, Butler County; and Washington Township, Westmoreland County.

In the Limestone Hill area, Steele district, Wood County, West Virginia, Hope Natural Gas Co. has located 2-9468 Frank Gilmore, elevation 827 ft., Belleville Quadrangle .35 mile South of Lat. 39°, 05′ and 2.50 miles West of Long. 81°, 30′. Columbian Carbon Co. located 1-GW-1157 Earl Ryan et al, elevation 834 ft., Belleville Quadrangle, .23 mile south of Lat. 39°, 05′, and 2.32 miles West of Long. 81°, 30′. This company's 1-GW-1149 S. M. Wigal et al, elevation 1,071 ft., topped the Oriskany sand at 5,343 ft. and is drilling at 5,365 ft. with no gas showing. Ravenwood district, Jackson County, Norman L. Botkin 1 Bonnie Dale Older et al, resulted in 50 bbl. of oil and 75,000 cu. ft. of gas per day, after shot, in the Berea sand, total depth 2,366 ft. Lee district, Mingo County, R. M. Kolze, Trustee, 2 Williamson Mining & Manufacturing Co, gaged 6,053,000 cu. ft. of gas, natural, in the Big Injun sand, total depth 2,506 ft.

Thirty-six new locations in West Virginia were reported during the past week: Sherman district, Calhoun County; Buffalo district, Clay County; Union district, Jackson County; Elk, Jefferson, and Union districts, Kanawha County; Sandhill district, Marshall County; Cologne district, Mason County; Hardee district, Mingo County; Curry and Pocatalico districts, Putnam County; Clay and Grant districts, Ritchie County; Harper and Reedy districts, Roane County; Buckhannon district, Upshur County; Grant district, Wayne County; and Steele and Williams districts, Wood County.

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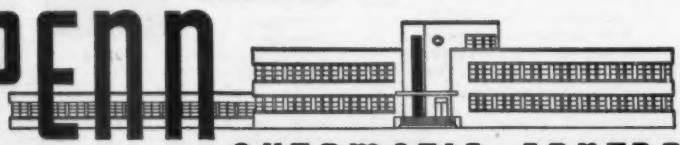

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North Central Texas

New Pay for Montague's Lone Prairie Field

WICHITA FALLS.—A new pay for Lone Prairie field of Montague County, tentatively identified as Strawn, was reported at W. H. Bryant 1 C. C. Lacy, Block 132, Belcher Subdivision, 5 miles south of Belcherville. Regular pay for the area is the Caddo conglomerate around 6,000 ft. The 1 Lacy was drilled to 6,143 ft., then plugged back to 4,918 ft. where it completed for 68 bbl. of 42°-gravity oil a day, on the pump, from perforations at 4,865-73 ft. Gas-oil ratio was 100 cu. ft.

Mid-Continent Petroleum Corp. 3 Seibert, Block 27, ET Survey, extended conglomerate production about 1 mile south of the Kennedy Caddo area of south-central Montague County. The well flowed 242 bbl. of oil a day through 16/64-in. choke, from perforations at 6,405-29 ft. Location is about 1 mile north of Mid-Continent 1 Embry, E. Wingate Survey, which completed from an upper conglomerate zone.

Mid-Continent 1 Upton Harbert "A," 2 miles southeast of Kennedy Caddo field in the E. Wingate Survey, A-835, was drilling below 6,250 ft., after topping the Caddo at 6,190 ft.

Four miles south of Dodson field, Jones, McFarland & O'Donnell, Dallas, 1 E. A. Fincher, a wildcat in Section 12, MEP&P Survey, A-522, ran a 45-minute drill-stem test in the Caddo lime from 6,033-43 ft. There was a weak blow of air for 10 minutes and recovery was 30 ft. of drilling mud. A 1-hour test at 6,089-6,101 ft. produced a good blow of air throughout the test and recovered 90 ft. of salty gas-cut mud. Flowing pressure was 80 psi. and bottom-hole pressure was 1,200 psi. in 15 minutes. Total depth was 6,180 ft.

Midland Oil Corp. 1 G. H. Guerin, R. H. Grimes Survey, 5 miles north of St. Jo and 1 mile east of production, reported an oil sand from 2,465-72 ft., and was said to be making about 50 bbl. of oil a day from the section.

In Fisher County, Texas Pacific Coal & Oil Co. 1 Velta P. Toler, Section 202-1-BBB&C Survey, 5 miles northwest of Hamlin, was showing for a Swastika discovery. Top of the section was 3,766 ft., and a 2-hour drill-stem test from 3,767-70 ft. had gas in 10 minutes. Recovery was 370 ft. of clean oil and 35 ft. of heavily oil and gas-cut mud. Flowing pressure was 260 psi. and 15-minute shut-in pressure was 1,535 psi. Operators cored ahead from 3,770-75 ft., recovering 3½ ft., of which 2 ft. was brown oil sand and the balance broken shaly sand. A second test was under way.

NORTH TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Haskell County: Pan American Production Co. 1 C. A. Jackson, Sec. 70, Coryell CSL, A-98, 3 mi. W Rule, TD 6,071 ft., PB 5,893 ft., elev. 1,569 ft., base Caddo 5,842 ft., Chester 5,864 ft., Ellenburger 6,032 ft., perf. 5,836-76 ft., pumped 37.12 bbl. of 39°-gravity oil a day, GOR 300 cu. ft.

Montague County: D. H. Bolin 1-C P. Howard, F. Robertson Sur., A-620, 14 mi. N Nocona, TD 1,648 ft., crinodal lime pay 1,630 ft., flowed 192 bbl. of 30°-gravity

oil a day, ½-in. choke, GOR 130 cu. ft., CP 350 psi., TP 100 psi.

Shackelford County: George F. McQueen 1 C. C. Gillean, Sec. 1530, TE&L Sur., 11 mi. NE Albany, TD 4,605 ft., PB 4,484 ft., elev. 1,239 ft., Lake sand 3,954 ft., Duffer 4,168 ft., perf. 4,062-80 ft., acidized, 590,000 cu. ft. gas a day, open flow., SIP 1,749 psi.

Taylor County: Sojourner Drilling Co. 1 Hollis McCoy, SE SE SE 8-18-T&P, 3 mi. SW Merkel, TD 5,430 ft., PB 5,387 ft., perf. Ellenburger 5,280-5,386 ft., pumped 21 bbl. of 49°-gravity oil a day, some water, GOR 200 cu. ft.

Throckmorton County: Cities Service Oil Co. 1-207 Swenson, 990 ft. from S and E lines, Sec. 207, BBB&C Sur., A-127, 10 mi. NW Throckmorton, TD 5,193 ft., PB 4,913 ft., elev. 1,461 ft., perf. Caddo 4,738-75 ft., flowed 111.89 bbl. of 39°-gravity oil in 7 hr., 24/64-in. choke, GOR 175 cu. ft., TP 175 psi.

Wilbarger County: James Blair Baker 1 W. T. Waggoner est., 5-5-H&TC, 7 mi. SW Electra, TD 2,407 ft., elev. 1,114 ft., Canyon sand 2,403 ft., pumped 25 bbl. of 36°-gravity oil a day.

Young County: Champlin Refining Co. 1 W. L. Hawkins, Sec. 1914, TE&L Sur., A-988, 3 mi. NW Loving, TD 4,819 ft., elev. 1,205 ft., PB 3,650 ft., perf. Strawn sand 3,571-87 ft., pumped 75 bbl. of 42°-gravity oil a day.

NORTH TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: C. B. Christie, Jr. 1 Mangold est., Blk. 12, Mangold Subd., McKinney & Williams Sur., A-305, 2 mi. N Mankins, dry, TD 1,790 ft.

Jennings, Man & Bailey 1 P. H. Himmel, Lot 1, Blk. 4, Clark & Plumb, 2 mi. N Windthorst, dry, TD 5,573 ft., Caddo around 5,310 ft.

C. W. & Wm. L. Snoddy 1 Wilson Properties, Blk. 112, ATNCL Sur., 8 mi. S Mankins, dry, TD 1,545 ft., Gunsight 1,440 ft.

Coleman County: George T. Lackey 1 Fred H. Stanton, Blk. 5, James D. Knox Sur., 4 mi. SE Rockwood, dry, TD 1,205 ft.

Cooke County: Voth Bros. Drilling Co. 1 A. Hoenig, J. C. Morgan Sur., A-151, 6 mi. SW Muenster, dry, TD 1,635 ft. in shale.

Coryell County: Cockburn et al 1 Kearnay, James Butterworth Sur., 10 mi. SE Gatesville, dry, TD 4,520 ft.

Montague County: Harvey Drilling Co. 1 Edde Howard "C," Blk. 70, Kaufman CSL, 9 mi. N Bonita, dry, TD 3,569 ft.

San Saba County: Clinton E. Smith 1 J. T. McDonnell, Jacob Schmidt Sur. 531, 8 mi. N San Saba, dry, TD 1,421 ft., elev. 1,193 ft., Marble Falls 1,282 ft., Ellenburger 1,361 ft.

Shackelford County: Guy Flint 1 David Parrish, Sec. 47, BAL Sur., 8 mi. SE Albany, dry, TD 2,107 ft., sand with oil show 2,096-2,101 ft.

Stephens County: G. E. Kadane & Sons 1 J. T. Ball, Sec. 1257, TE&L Sur., 6 mi. NW Breckenridge, dry, TD 4,400 ft., elev. 1,135 ft., Caddo 3,206 ft., conglomerate 3,954 ft., Mississippian 4,138 ft., Ellenburger 4,372 ft.

Stonewall County: Tom B. Medders and S. B. Roberts 2 C. E. Boyd, 45-D-H&TC, 6 mi. NE Aspermont, dry, TD 6,193 ft. in lime and dolomite, elev. 1,655 ft.

Taylor County: Taubert Drilling Co. 1 J. E. Morton, D. T. Bruce Sur., 9 mi. NW Abilene, dry, TD 2,879 ft., elev. 1,710 ft., Flippen sand 2,208-14 ft. had show oil and salt water, Swastika 2,825 ft., base Saddle Creek 2,192 ft.

Wichita County: Bay Petroleum Corp. 1 S. M. Gose, Blk. 37, Kemp WVFL Subd., 1½ mi. SE Kamay, dry, HD 1,900 ft., elev. 1,026 ft.

Louis Sikes 1 Louis Sikes, fee, O. H. P. Davis Sur., A-65, 1 mi. SW Wichita Falls, dry, TD 5,626 ft., Ellenburger 5,468 ft.

Wilbarger County: Baker & McCullough 1 J. M. Cambron, 8-5-H&TC, 8 mi. S Harold, dry, TD 2,441 ft.

Young County: E. H. and E. M. Remington 1 L. R. Drum, Jr., J. W. Paddock Sur., 5 mi. N Loving, dry, TD 601 ft.

Rocky Mountain

New Discovery Apparent in Denver-Julesburg Basin

DENVER. — A new discovery for the northeastern Colorado portion of the Denver-Julesburg basin play seems evident following a test at Shell Oil Co. 1 Hanson, NE NE NE 33-8n-59w, wildcat in the Buckingham area, Weld County. On drill-stem test in the top of the Muddy between 6,715-26 ft. the well had gas to the surface in 5 minutes and the recovery was 4,900 ft. of gassy oil in the 2-hour test. As tester was pulled the well cleaned itself and started to flow. The oil is 38° gravity, light, green, paraffin base. Shell is coring ahead on the well below 6,726 ft. in the Muddy. Sample top of Muddy was logged at 6,713 ft.

Location for this wildcat followed seismic surveys through the area by Shell and the well is the operator's first in this basin. Shell has made an extensive land play throughout the basin and is continuing its seismic work through the region. Several wildcats have been drilled in the Buckingham area since discovery of oil 20 years ago in the Greasewood area, 15 miles southwest of the new discovery. Previous wells in the area have had shows of oil and gas in the Muddy and Dakota sands.

Sinclair Oil & Gas Co. has completed a good new-pay discovery in its Happy Springs field, Fremont County, Wyoming, at 2 Unit, SW NW SW 16-28n-93w, one-third of a mile northwest of its Muddy sand discovery well. The new well swabbed 520 bbl of oil daily from the Frontier sand. Basal Frontier was topped at 5,904 ft. with total depth at 6,084 ft. and casing was cemented on top of the sand. The discovery well was drilled to Tensleep, below 10,000 ft., last year, and was a failure in that formation but was plugged back for a small oil producer in the Muddy.

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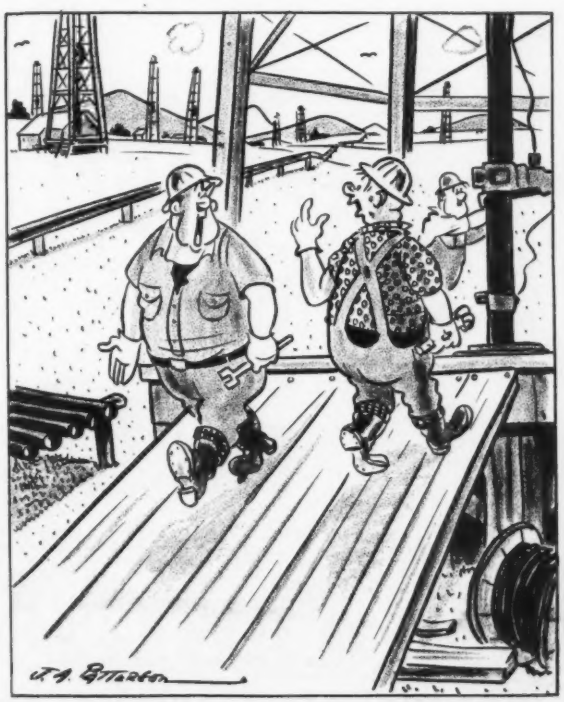

THE OIL AND GAS JOURNAL

"Hello! Hello! Hello! Blast it, Northgate, you don't have to speak EVERY time we pass!"

The first of a series of three tests in southeastern Montana has been started by Delhi Oil Corp. in the Southwest Wolf Creek area. Well 1 Federal-Wheatley, C SE SW 10-9n-56e, will be a Dakota test on acreage farmed out by Delhi from Carter Oil Co. Carter retained a spread through the area. This part of the Powder River basin has been of interest for the past 4 years, since discovery of oil in terraces along the east side of the basin at Mush Creek—Fiddler Creek—Skull Creek in Wyoming. Amerada Petroleum Corp. has led in the exploratory drilling campaign through the area, and has drilled 12 dry holes in Crook County, Wyoming, and Carter County, Montana.

A new gas discovery is listed for the west side of the Denver basin with completion of the W. E. Atkinson-C. S. Lavington 1 Greer, C SE SW 30-5n-68w, wildcat in the Loveland area, Weld County. The well flowed 1,530,000 cu. ft. of gas daily from a zone in the Hygiene between 1,432-43 ft. The operator is now going into an old hole to attempt to obtain commercial gas production from a similar zone. The California Co. and J. G. Dyer of Denver have interests in the area.

COLORADO WILDCAT FAILURES

Fort Morgan, Morgan County: Platte River Oil & Gas Co. 1 Fuerst, NE NE NW, 1-3n-59w, 6,005 ft. TD; suspended indefinitely; Hygiene 2,652 ft., Niobrara 5,174 ft., Timpas 5,430 ft., Benton shale 5,482 ft.

Platte River Oil & Gas 2 Fuerst, SE NE NW, 1-3n-50w, 6,042 ft. TD; suspended indefinitely; Niobrara 5,180 ft., Timpas 5,450 ft., Muddy 5,884 ft., Dakota 5,961 ft.

Burroughs dome, Routt County: W. E. Atkinson 1 State, SE NW SE 14-6n-85w, 2,015 ft. TD; dry, Frontier 240 ft., Dakota 693 ft., Morrison 844 ft., Sundance 1,211 ft., Chinle 1,366 ft., Granite 2,005 ft.

UTAH WILDCAT FAILURE

White Valley area, Box Elder County: Promontory Oil Co. 1 Jensen, C SE SE 7-13n-4w, 7,321 ft. TD; suspended indefinitely.

WYOMING WILDCAT FAILURES

Spring Gap, Unita County: Ed Delaney 1 Govt., NE SE NE 18-16n-117w, 1,020 ft. TD; dry.

Beaver Valley, Weston County: M. E. Morton & Woodward Oil 1 Rumpletes, C SE NE 19-43n-62w; 4,113 ft. TD; dry, Newcastle 3,812 ft., Dakota 4,068 ft.

NORTHERN NEW MEXICO WILDCAT FAILURE

El Huerfano, San Juan County: Stanolind Oil & Gas Co. and Slick-Moorman 1 Unit, C SE NE, 21-26n-10w; 2,150 ft. TD; dry.

NEBRASKA WILDCAT SUCCESS

East Sioux, Cheyenne County: Deep Rock Oil Corp. and Frontier Refining Co. 1 Siemers, SW SW NW, 6-14n-49w; 4,845 ft. TD; pump 181 bbl. oil and 3 bbl. water in 24 hours, 7-in. casing at 4,840 ft., Fort Hayes 4,125 ft., Codell 4,248 ft., Greenhorn 4,408 ft., "D" sand 4,760 ft., "J" sand 4,824 ft.

SOUTH DAKOTA WILDCAT FAILURE

Boxelder trend, Meade County: Morton Oil Co.-Amerada Petroleum Corp. 1 V. Olsen, NE NE NE, 35-3n-9e; 4,202 ft. TD; dry, Muddy 2,011 ft., Dakota 2,283 ft., Fuson 2,370 ft., Lakota 2,435 ft., Morrison 2,468 ft., Spearfish 2,980 ft., Minnekahta 3,409 ft., Opeche 3,458 ft., Minnelusa 3,575 ft.

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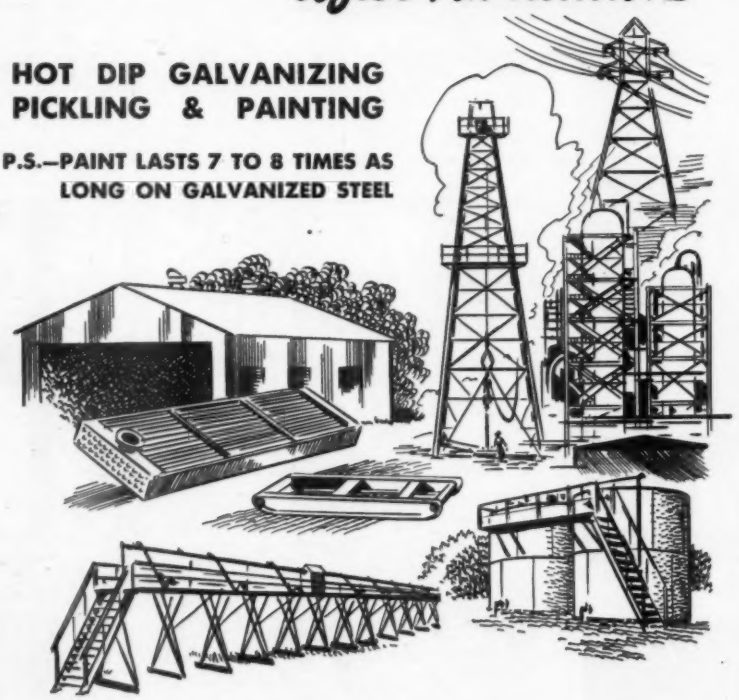

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Louisiana-Arkansas

Paluxy Shows Signs of Production Near Bistineau

SHREVEPORT.—Four miles south of Bistineau gas field, Bienville Parish, E. C. Cook 1 W. C. Locke, 9-15n-10w, had prospects of commercial production from the Paluxy, entered at 2,756 ft. on elevation of 185 ft. A drill-stem test from 2,792-2,800 ft., total depth, recovered 120 ft. of 42°-gravity oil and 20 ft. of mud in 30 minutes. Operators ran electrical surveys and set casing to 2,782 ft. At last report it was flowing an estimated 25 bbl. of oil a day, by heads, under flowing tubing pressure of 525 psi.

Four miles south of Saline Lake field, Catahoula Parish, Hunt Oil Co. 28 Louisiana Delta, SE SE 30-4n-5e, was drilling at 4,065 ft. in shale. The new wildcat is a Wilcox test.

Continental Oil Co. 1 Wideman, Claiborne Parish wildcat, was drilling shale and lime at 8,052 ft., identified as Smackover. Cores from 7,839-87 ft. recovered 48 ft. of shale.

Stanolind Oil & Gas Co. 1 Meadors, 8-22n-5w, Claiborne Parish, was coring lime at 11,385 ft. Recovery from 11,065-370 ft. was nonporous lime and siltstone with no shows.

Carnes & May 1 Clark, 7-15n-8e, Franklin Parish, was reported swabbing oil and salt water from perforations in the Paluxy at 3,851-60 ft. No estimate had been made on recovery. Total depth was 4,410 ft.

In Union Parish, Southwest Gas Producing Co. 1 Colvin, 8-21n-2w, was in Travis Peak shale at 7,478 ft.

NORTH LOUISIANA SUCCESSFUL WILDCAT

Concordia Parish: Carter Oil Co. 1 Clyde C. Graham, 660 ft. N, 661 ft. E, SW SE NE 48-5n-9e (Irregular), TD 6,710 ft., perf. Wilcox 5,980-86 ft., flowed 360 bbl. of 47°-gravity oil a day, ¼-in. choke, TP 475 psi., GOR 4,401 cu. ft.

ARKANSAS SUCCESSFUL WILDCAT

Union County: Marine Oil Co. 1 Whited, NE NE NE 1-18s-13w, TD 5,019 ft., PB 2,400 ft., pumped 6 bbl. oil a day from Nacatoch 2,337-2,400 ft.

ARKANSAS WILDCAT FAILURES

Ouachita County: L. W. Powell 1 B. Autrey, SW SW SW 29-14s-19w, dry, TD 2,226 ft.

Union County: Caddo Oil Co. 1 W. C. Smith, NW SW SW 23-18s-15w, dry, TD 2,380 ft.

T. L. James & Co., Inc. 1 Clark heirs, NE NE NE 30-19s-12w, dry, TD 2,339 ft.

Kansas

Forest City Basin Gets Third Discovery in Row

THE third oil discovery in as many weeks for the Forest City Basin, northeastern Kansas, has been made by Skelly Oil Co. at its 1 Fearon, NW SW NE 11-11-11e, northern Wabaunsee County. Good saturation was found in Viola lime, topped at 2,901 ft. (—1,773 ft.). Hole was drilled 4 ft. in the pay, and in a drill-stem test of the interval 910 ft. of clean oil was recovered. Tool was open 115 minutes for the test. Indicated bottom-hole pressure was 1,178 psi. Gravity of the oil was 27° A.P.I. There was no indication of water. Casing has been run to the top of the zone.

Hunton lime, topped at 2,575 ft., also carried good oil showings. Two drill-stem tests were made in this zone. In the first, taking in an interval at 2,577-82 ft., 15 ft. of oil and 110 ft. of mud and salt water was recovered. The second test, taking in the next 7 ft. of pay, yielded 2 ft. of heavy oil with 1,046 ft. of oil-cut salt water. Slight showings previously had been found in the Kansas City lime, logged at 1,311-1,525 ft.

Location of this well is about 15 miles to the northeast of the same company's 2 Thoewe, SW SE NE 2-13-10e, one of the other prospective new discovery wells for the Forest City Basin.

The other prospective discovery well is Carter Oil Co. 1 O. Strahm, NW SW NW 13-2-14e, northeastern Nemaha County, near the Nebraska line. This well, as previously reported, had good saturation in both the Hunton and Viola. Deepened in exploration of lower potential pay zones, the well, as this is written, had reached the Arbuckle topped at 3,909 ft. (—2,757 ft.). The Hunton and Viola had been topped at 2,825 ft. (—1,573 ft.) and 3,480 ft. (—2,228 ft.), respectively. In deepening small showings also were found in Simpson sand, topped at 3,737 ft.

KANSAS SUCCESSFUL WILDCATS

Seward County: White Eagle 1 Warden, SE SE NW 13-35s-33w, elev. 2,788 ft., 6,800,000 cu. ft. of gas per day, TD 6,131 ft., Krider 2,667 ft., Lansing-Kansas City 4,520 ft., Atoka 5,637 ft., Morrow 5,848 ft., Morrow sand 6,060 ft.

Stafford County: Crown-Glick 1 Van Winkle, NW SW SW 23-21s-14w, elev. 1,935 ft., pumped 104 bbl. of oil per day from 3,570-74 ft. and 3,592-96 ft., TD 3,748 ft., Heebner 3,280 ft., lime 3,400 ft., Lansing-Kansas City 3,419 ft., Arbuckle 3,767 ft.

KANSAS WILDCAT FAILURES

Barton County: Vickers-Jayhawk 1 Musser, SE SE SE 35-20s-15w, elev. 1,928 ft., dry, TD 3,810 ft.

Butler County: Birmingham & Bartlett 1 Case, NW SW NE 6-25s-6e, elev. 1,382 ft., dry, TD 3,023 ft.

Birmingham & Bartlett 1 Ralston, NW NE NE 6-28s-4e, elev. 1,284 ft., dry, TD 2,987 ft.

Ellis County: Francis 1 Jacobs, NW NW NE 24-13s-19w, elev. 2,057 ft., dry, TD 3,700 ft.

Heathman et al. 1 Balls, NE NE NE 6-12s-18w, elev. 2,096 ft., dry, TD 3,696 ft.

Jones-Shelburne & Farmer 1 Campbell, NE NE NE 30-15s-17w, elev. 1,977 ft., dry, TD 3,565 ft.

Laura Jane 1 Herl, SW SW SE 22-14s-17w, elev. 1,971 ft., dry, TD 3,585 ft.

Graham County: Keystone 1 Thomas, NW NW NW 12-10s-22w, elev. 2,305 ft., dry, TD 4,065 ft.

Midstates et al. 1 Teall, NW NW NW 20-10s-21w, elev. 2,317 ft., dry, TD 4,015 ft.

Jones-Shelburne & Farmer 1 Barrow, SW SW NW 17-7s-23w, elev. 2,415 ft., dry, TD 4,183 ft.

Morris County: Basco 1 Novak, SW SW NW 28-17s-5e, elev. 1,485 ft., dry, TD 2,370 ft.

Pawnee County: Stag 1 Yeager, SE SE SE 11-21s-17w, elev. 2,006 ft., dry, TD 3,890 ft.

Reno County: Melland 1 Linscheid, SW SW SW 26-24s-8w, elev. 1,626 ft., dry, TD 4,245 ft.

Rooks County: Phillips & Hanson 1 Ekey, SE SE NE 2-10s-17w, elev. 2,059 ft., dry, TD 3,575 ft.

Sedgwick County: Westgate-Greenland 1 Albers, NW NW SE 20-27s-4w, elev. 1,365 ft., dry, TD 3,739 ft.

Woodson County: Landon-Bisagno 1 Lauber, NW NW SE 12-26s-14e, dry, TD 1,550 ft.

EASTERN NEBRASKA

Three new producers were added to Barada field in Richardson County: Stephens 1 Wentz, NW SW SW 1-2n-16e, total depth 2,413 ft.; Stephens 1 Fehr, SE NE NW 11-2n-16e, total depth 2,446 ft.; Shaw-Newlin 1 Horn, SW SE SE 35-3n-16e, total depth 2,512 ft.

EASTERN NEBRASKA SUCCESSFUL WILDCAT

Richardson County: Thompson Drilling 1 Prichard, SE NE NW 15-2n-16e, elev. 963 ft. (bushing), pumped 20 bbl. of oil per day from Hunton at 2,370-79 ft., TD.

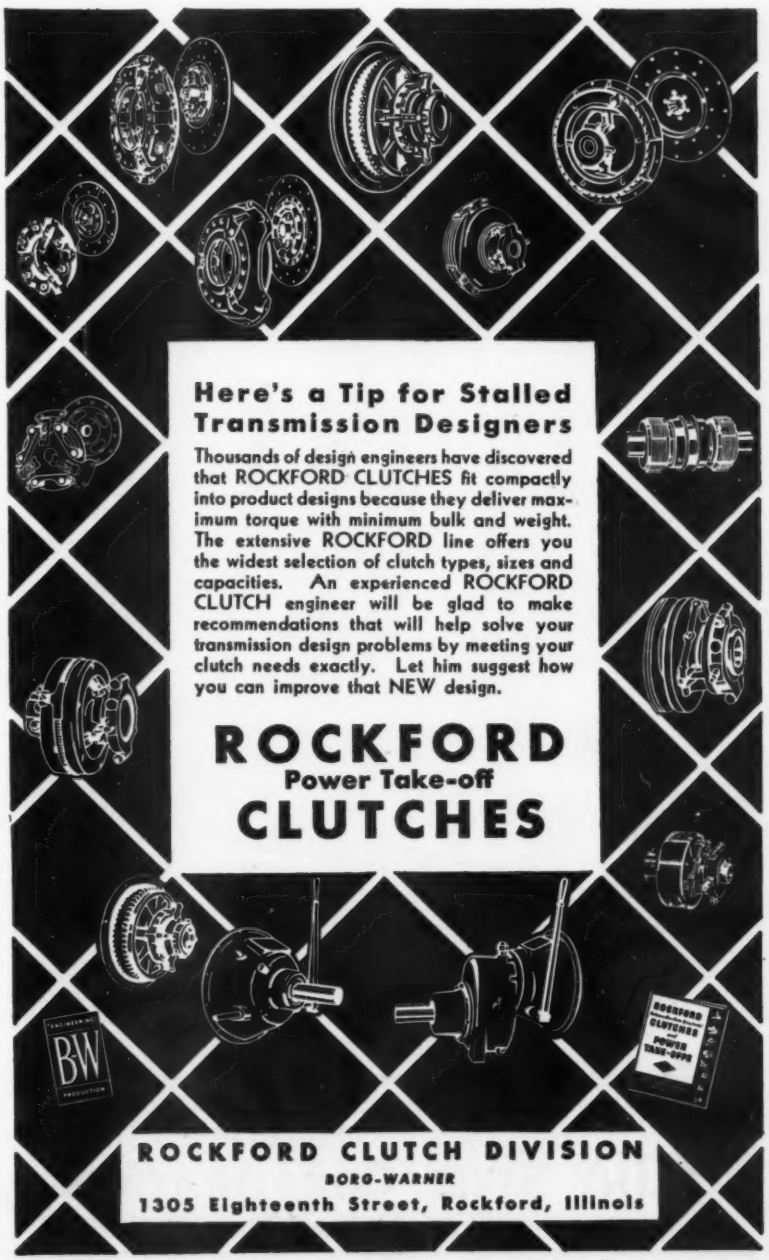
EASTERN NEBRASKA WILDCAT FAILURE

Richardson County: Kitrell 1 Duerfeldt, SW SE NW 31-3n-17e, elev. 1,024 ft., dry, TD 2,431 ft., Hunton 2,412 ft.

Illinois-Ind.-Ky.

Rosiclare Well Reopens North Clay County Area

THE area around the abandoned Ingraham pool, 4 miles north of Sailor Springs, in the northeast corner of Clay County, Illinois, is being revived by what appears to be a good Rosiclare well now


Here's a Tip for Stalled Transmission Designers
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being completed by Skiles Oil Corp. The well, 1 Hinterscher and associates, SW NW SE 4-4n-8e, kicked off after swab was run and flowed at the rate of 10 bbl. of oil per hour. Total depth is 2,992 ft. with pay at 2,981-91 ft., open below casing. The location is southwest of the Ingraham pool's former production which was from the McClosky lime. Present nearest production is in the Passport pool, about 2½ miles east and a little south.

A half-mile extension to the west for the central portion of the Storms pool, White County, is indicated by results of a drill-stem test by Ryan Oil Co. in its 1 Morrill, NW NW SW 11-6s-9e. Approximately 1,130 ft. of clean oil and 70 ft. of mud-cut oil was recovered in the test, which was made in Cypress sand at 2,750-73 ft. Indicated bottom-hole pressure was 1,225 psi. Tool was open 60 minutes. Hole has been drilled to 2,781 ft. and 7-in. casing run to 2,749 ft. for completion. Cypress sand is a new pay zone for that sector of the pool. The area is about 5 miles south of Carmi.

Another Cypress sand discovery appears to have been made by Bradley & Neal and J. W. Rudy in their 1 Duncan Heirs, SW SW SE SE 20-1s-14w, 2 miles south of Bone Gap, Edwards County, Illinois. A 60-minute drill-stem test in the above sand at 2,703-12 ft. yielded 60 ft. of clean oil and 90 ft. of oil-cut mud in the pipe breakdown.

ILLINOIS SUCCESSFUL WILDCAT

Clinton County: Deep Rock Oil Corp. 1 Johnpeter, NE SW SE 23-1n-3w, IP 99 bbl., Devonian 2,554-60 ft., TD 2,564 ft. (opens new pool).

ILLINOIS WILDCAT FAILURES

Bond County: E. G. Wilker 1 Fox, SW SW SE 11-4n-2w, dry, TD 1,247 ft.

Coles County: C. W. Davey 1 Annis, SW SW NE 28-12n-8e, dry, TD 2,233 ft.

Edgar County: B. F. Williams 1 Sizeman, SE NE SE 16-13n-11w, dry, TD 1,275 ft.

Gallatin County: Coy Oil Co. 2 Davis, SW SW NE 1-8s-8e, dry, TD 2,570 ft.

Skiles Oil Corp. 1 Hennenberger, NE SE SE 23-8s-8e, dry, TD 2,470 ft.

Hamilton County: G. L. Reasor 1 Carnahan, NE NW SE 24-6s-6e, dry, TD 3,360 ft.

Jasper County: J. Zanetis 1 Winterrowd, NW NE NE 10-6n-9e, dry, TD 3,040 ft.

Jefferson County: Bell Brothers 1 Green, SE NE SW 12-2s-4e, dry, TD 3,132 ft.

Lawrence County: Big Four Oil & Gas Co. and Hayes Drilling Co. 1 Simms, SW NW SE 26-3n-13w, dry, TD 2,373 ft.

Skiles Oil Corp. 1 Dolishan, NW NW NE 5-4n-11w, dry, TD 2,373 ft.

Logan County: P. F. Thompson 1 Will, SW NW SE 7-19n-3w, dry, TD 1,314 ft.

Madison County: Edgar White 1 Knostermeier, NE NE NE 32-6n-7w, dry, TD 526 ft.

McDonough County: A. N. Logan 1 Sullivan, NE SW SE 24-6n-3w 4th P.M., dry, TD 510 ft.

Pratt County: R. E. McDowell 1 Schwartz, SE SE NE 18-19n-5e, dry, TD 1,787 ft.

Washington County: Superior Oil Co. 1 Schwind, NE NW NW 32-3s-1w, dry, TD 1,692 ft.

INDIANA WILDCAT FAILURES

Gibson County: Columbus Exploration Co. 1 Bush, NW NW NW 33-2s-11w, dry, TD 2,518 ft.

George & Wrather 1 Creek, NE NW NE 19-3s-12w, dry, TD 2,828 ft.

Posey County: Skiles Oil Corp. 1 Wassmer, SW NE SW 8-4s-12w, dry, TD 2,825 ft.

Wells County: George Reasor 1 fee, NE SW NW SE 30-26n-12e, dry, TD 1,035 ft.

WESTERN KENTUCKY SUCCESSFUL WILDCAT

McClean County: R. Hal Compton et al., 1 Clines, SW SW NE SE 4-N-26, IP 40 bbl., Cypress 1,927-50 ft., TD 1,959 ft.

WESTERN KENTUCKY WILDCAT FAILURES

Daviess County: Valley Drilling Co. 1 Watkins, N½ NE NE SW 13-N-31, dry, TD 900 ft.

Henderson County: James C. Ellis 1 Towers Church, SW NW SE 1-P-25, dry, TD 2,297 ft.

Webster County: Sinclair Oil & Gas Co. 1 Clark, W½ SE SE NW 8-N-24, dry, TD 2,614 ft.

EASTERN KENTUCKY

ASHLAND.—Ashland Oil & Refining Co. has announced location for 3 S. Q. Kelly 7-R-79 Johnson County. Well will be an attempt to extend production to the southwest in the Martha pool. Objective sand will be the Weir (Mississippian) expected at about 850 ft. Test is approximately ¼ mile airline northwest of Paintsville, the county seat.

In Big Sandy gas field, United Carbon Co. has completed 1 Minerva Maynard for 794,000 cu. ft. of gas daily from Devonian black shale 2,725 to 3,420 ft. with total depth being 3,426 ft. Well is located in Pike County sector and was shot with 5,000 lb. of gelatin.

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Ohio Fields

Portage County Test Finds Clinton Gas

COLUMBUS.—John Galey et al., drilling a second well in a semiwildcat area of Portage County, found gas 6 ft. in the white Clinton at the 1 J. Shipley, Lot 33, Ravenna Township. The red Clinton at 4,227-65 ft. had only a show of gas. The white was topped at 4,265 ft. with 1,500,000 cu. ft. natural.

Hipp Lumber Co. extended Greer pool ¼ mile to the southwest with a small well on 1 Mary Jergens, Section 1, Jefferson Township, Knox County. The lower Clinton at 2,836-51 ft. made 5 bbl. natural and 30 bbl. in 24 hours after shot.

Fairfield Drilling 1 C. M. Henderson, Section 2, Reading Township, Perry County, had a fair oil showing in the Clinton, logged at 3,076-3,104 ft. After shooting, the well made an estimated 40 bbl. the first day.

Willard Shrider et al., 1 Richards, Third quarter, New Castle Township, Coshocton

County, made 80 bbl. in 24 hours after shot. The Clinton came in at 3,225-80 ft.

Oklahoma

Milroy Area Outpost Showing for Producer

STANOLIND OIL & GAS CO. is in process of testing its 1 Chickasaw, SE SE SE 2-2s-4w, Stephens County. The well, located in the area north of the Milroy pool and between the northwest extension development of the Camp pool and the southeastern extension area of the Velma pool, provides another possible link in connecting the production of the three active pools.

With hole plugged back from a total depth of 6,000 ft. to 5,753 ft., casing, set at the plug-back depth, was perforated first at 5,614-34 ft., where, in a preliminary drill-stem test with packer at 5,590 ft., oil flow was gaged at an average rate of slightly over 40 bbl. per hour. Gravity of oil was 35° A.P.I. A later test from a lower level, where casing was perforated at 5,660-84 ft., resulted in a flow of 163 bbl. of oil in 3 hours. Flow was through 1-in. choke.

Another outpost well in the same area also is showing for a good producer. It is Sinclair Oil & Gas Co. 1 Arnett, NW SE NE 3-2s-4w, about a mile northwest of the Stanolind well and about ¾ mile southeast of production of the Velma pool. Substantial oil recoveries were made in drill-stem tests at various levels, most promising of which were in tests at 5,445-77 ft. and 5,920-70 ft. Since these tests, previously reported, hole has been drilled to a total depth of 6,330 ft., where casing has been run.

No authoritive information is available as yet on Peppers Refining Co.'s 1 Smith, NW NW SE 4-2n-8w, prospective oil discovery well 5 miles northwest of Marlow, in the northwestern part of Stephens County. The well is reported to have flowed about 15 bbl. of oil per hour after perforating casing at an undisclosed depth, believed to be in a sand around 7,095 ft.

Productive area at the northwest end of the Elk City field in Beckham County continues to widen. Latest extension is at Shell Oil Co. 1-C Kelly, C SE SW 5-10n-12w, where production is virtually assured by showings in initial drill-stem tests.

OKLAHOMA SUCCESSFUL WILDCATS

Cleveland County: Benson-Montin, Inc., 1 Pearcey, SW SW SE 30-6n-1e, elev. 1,112 ft., flowed 8,893,000 cu. ft. of gas (plus 55 bbl. of distillate per 1,000,000 cu. ft.) from fourth Deese at 5,786-5,914 ft., TD 6,851 ft., Hogshooter 3,809 ft., Checkerboard 5,021 ft., second Checkerboard 5,172 ft., Deese 5,209 ft., first Deese sand 5,279 ft., second Deese sand 5,511 ft., third Deese sand 5,651 ft., basal Pennsylvanian-Woodford 5,874 ft., Hunton 5,899 ft., Chimney Hill 6,102 ft., Sylvan 6,162 ft., Viola 6,304 ft., Trenton 6,387 ft., first Bartlesville sand 6,753 ft.

Hughes County: Summers 1 Ulmstead, NE NE NE 35-8n-10e, 1 mi. S extension to Greasy Creek, elev. 856 ft., flowed 4,500,000 cu. ft. of gas per day from Hart sand at 2,558-74 ft., TD 2,613 ft.

Okmulgee County: Pine 1 Lucas, NE NW SW 34-12n-13e, elev. 788 ft., pumped 17 bbl. of 39°-gravity oil per day from Union Valley at 2,354-66 ft., TD 2,485 ft., sand 1,075 ft. and 1,904 ft., lime 1,955 ft., sand 2,096 ft., broken lime 2,110 ft., sand 2,190 ft., lime 2,240 ft., Cromwell 2,470 ft.

Pawnee County: Deardorf 1 Gould, NE SW NW 33-20n-5e, new pay in No. Garr, elev. 973 ft., flowed 180 bbl. of 42°-gravity oil per day from Peru at 2,847-60 ft., TD.

Pittsburg County: Deep Rock 1 Eckles, NE SW NW 12-7n-11e, est. elev. 782 ft., flowed 7,200,000 cu. ft. of gas per day from third Cromwell at 3,905-28 ft., TD 4,062 ft., lime 1,945 ft., Booch 2,215 ft., Hart 2,415 ft., Gilcrease 2,786 ft., Wapanucka 3,464 ft., Union Valley 3,695 ft.

OKLAHOMA WILDCAT FAILURES

Comanche County: Jones & Estes 1 McCormick, SE SE NE 24-2n-11w, dry, TD 265 ft.

Cotton County: Larson & Thomas 1 Booher, SE SW SW 25-3s-13w, dry, TD 2,193 ft.

Creek County: Mid-Continent 1 Mahan, NE SW NE 22-16n-7e, elev. 934 ft., dry, TD 3,345 ft.

Harmon County: Kingwood 1 Parr, NE NW NE 32-2n-25w, elev. 1,609 ft. (DF), dry, TD 6,879 ft.

Jefferson County: Stagner 1 Stallings, NE NE SE 9-4s-4w, elev. 862 ft., dry, TD 3,280 ft.

Hedge 1 Brown, SW NW NW 23-6s-6w, elev. 881 ft., dry, TD 2,615 ft.

Lincoln County: Woods-Gilchrist Oil 1 Dunn, NW NE SE 28-12n-2e, elev. 1,138 ft., dry, TD 5,475 ft.

Harper-Turner & Casswell 1 Ladd, NE NE NW 25-13n-5e, dry, TD 4,636 ft.

Deep Rock 1 Graham, SW SW SE 35-15n-6e, elev. 884 ft., dry, TD 4,127 ft.

Logan County: Zephyr Petroleum and Alpha Petroleum 1 Kightlinger, NE NE SW 11-16n-1w, dry, TD 5,731 ft.

Osage County: Oliphant 1 Osage, NE NE SW 32-26n-5e, elev. 1,125 ft., dry, TD 3,399 ft.

Pawnee County: Elson 1 Cannon, SW SW NE 18-20n-6e, elev. 898 ft., dry, TD 3,358 ft.

Payne County: Patton Brothers Drilling and Tully 1 Ross, NW NW NE 12-18n-3e, dry, TD 3,974 ft.

Dirickson-Lewis Drilling 1 Walker, NW NW NW 20-19n-1w, elev. 1,128 ft., dry, TD 4,962 ft.

Tillman County: Bridwell Oil 1 Newsom, SE NW SW 32-1s-18w, dry, TD 4,981 ft.

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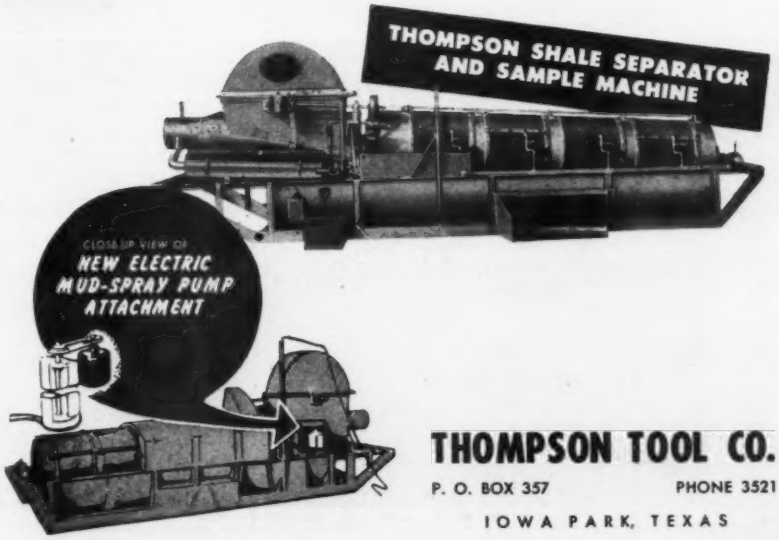

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IOWA PARK, TEXAS

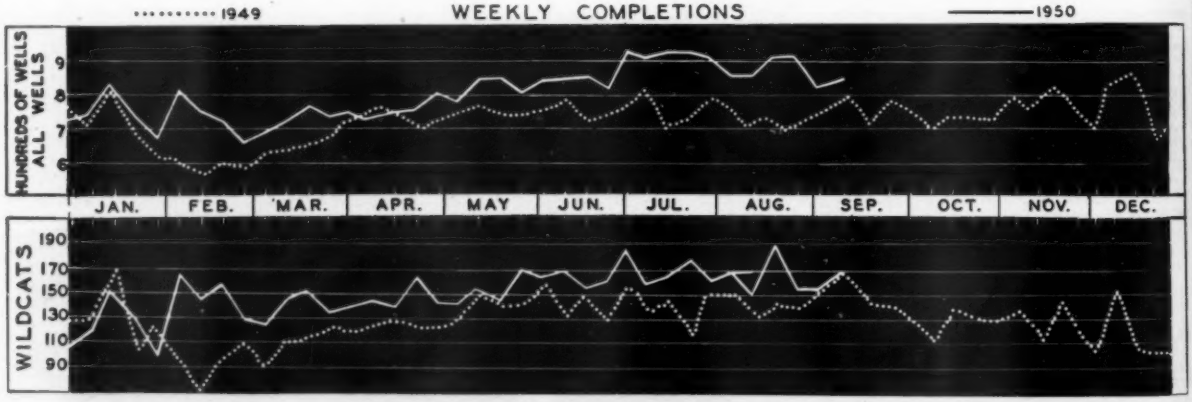
CURRENT STATISTICS

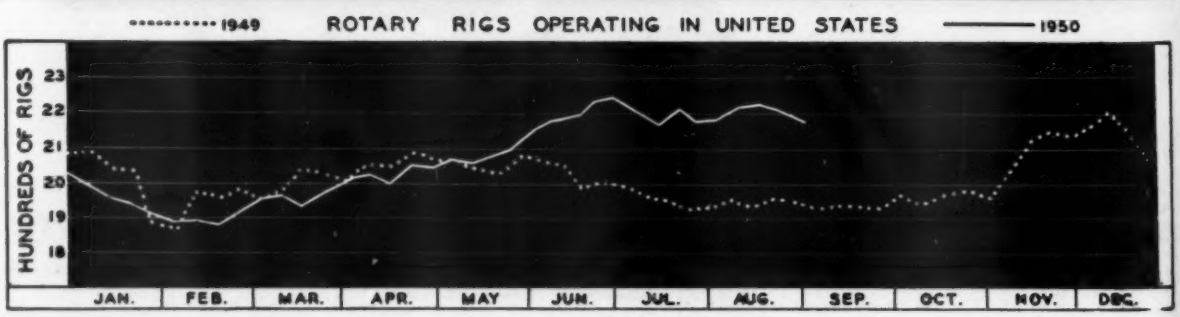
EXPLORATION

WEEKLY WELL COMPLETIONS . . . WEEK ENDED SEPTEMBER 9, 1950

	Total of all wells					Sept. 9		Wildcat completions and discoveries					Cumulative total, 1950				
	Comp.	Oil	Gas	Dry	Footage	1950	1949	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	18	9	0	*9	25,913	466	717	0	0	0	0	0	0	0	0	0	0
Pennsylvania	20	9	4	†7	39,786	917	1,139	0	0	0	0	0	0	0	1	2	3
West Virginia	14	2	10	2	40,839	464	341	0	0	0	0	0	0	0	14	15	29
Ohio	18	6	7	5	35,762	680	766	0	0	0	0	0	1	0	2	8	11
Indiana	48	14	6	28	78,594	1,141	922	0	0	0	4	4	40	0	1	188	229
Kentucky	35	11	3	21	55,760	782	644	1	0	0	3	4	19	0	1	64	84
Illinois	48	22	0	26	104,635	1,860	1,741	1	0	0	15	16	39	0	1	417	457
Michigan	24	8	0	‡16	54,165	602	683	0	0	0	9	9	22	0	4	200	226
Kansas	76	27	11	38	259,084	2,577	2,244	1	0	1	16	18	69	0	8	420	497
Nebraska	7	6	0	1	17,026	79	19	2	0	0	1	3	6	0	1	37	44
Oklahoma	93	55	3	35	327,828	3,723	2,990	2	0	3	15	20	114	6	14	458	592
Texas	304	195	21	88	1,410,496	11,219	9,336	14	2	9	41	66	352	29	81	1,758	2,220
North Central (Dist. 7-B & 9)	83	40	1	‡42	244,108	3,404	3,102	6	0	1	16	23	155	2	20	695	872
West (Dist. 7-C & 8)	99	83	2	14	540,320	3,367	2,225	0	0	2	6	8	68	2	4	331	405
Panhandle (Dist. 10)	15	12	3	0	45,966	637	677	0	0	0	0	0	1	0	2	13	16
Eastern (Dist. 5, 6, & 6-P)	18	12	3	3	92,936	808	581	1	0	0	2	3	10	4	3	138	155
Gulf Coast (Dist. 2 & 3)	45	19	9	‡17	274,743	1,570	1,387	4	0	4	13	21	62	12	29	261	364
Southwest (Dist. 1 & 4)	44	29	3	12	212,423	1,433	1,364	3	2	2	4	11	56	9	23	320	408
Louisiana	52	30	4	18	272,211	1,691	1,596	1	0	0	2	3	34	15	5	139	193
Northern	32	22	3	7	89,827	910	923	1	0	0	0	1	5	3	2	63	73
Southern	20	8	1	11	182,384	781	673	0	0	0	2	2	29	12	3	76	120
Arkansas	11	6	0	5	36,302	284	226	1	0	0	3	4	9	0	0	69	78
Mississippi	9	2	0	7	65,614	225	246	0	0	0	4	4	8	2	0	81	91
Southeastern States	0	0	0	0	0	44	36	0	0	0	0	0	1	0	1	24	26
Montana	1	0	0	1	3,378	150	168	0	0	0	0	0	1	0	0	26	27
Wyoming	13	10	0	3	60,192	398	422	0	0	0	2	2	16	0	0	53	69
Colorado-Utah	4	0	0	4	21,383	57	100	0	0	0	4	4	4	0	0	37	41
New Mexico	12	6	3	3	53,011	427	359	0	0	0	2	2	10	1	0	39	50
California	42	31	1	10	218,349	1,227	1,815	1	0	0	8	9	18	0	3	262	283
Miscellaneous	1	0	0	1	4,202	36	15	0	0	0	1	1	0	0	0	11	11
Total United States	850	449	73	328	3,184,530	29,049	26,525	24	2	13	130	169	763	53	137	4,308	5,261
Total previous week	832	451	48	333	2,984,673	....	....	27	2	3	123	155	739	51	124	4,178	5,092
Total September 9, 1949	793	435	67	291	2,900,602	....	....	21	3	6	130	160	662	63	137	3,853	4,715

Service wells included: *9, †7, ‡1.





DAILY AVERAGE PRODUCTION FOR WEEK

	Sept. 9 crude oil	B. of M. Sept. demand	Sept. 2 crude oil
Alabama	2,100	1,600	2,050
Arkansas	82,550	90,000	82,400
California	902,300	928,000	891,900
Colorado	63,400	67,000	62,700
Eastern	61,600	65,000	61,500
Florida	1,750	1,400	1,625
Illinois	180,800	188,000	176,900
Indiana	32,700	31,000	31,700
Kansas	277,200	306,000	293,500
Kentucky	28,300	30,000	27,800
Louisiana	579,800	590,000	576,000
North Louisiana	117,250	.....	116,300
South Louisiana	462,550	.....	459,700
Michigan	42,800	47,000	47,600
Mississippi	105,400	120,000	107,450
Montana	24,200	24,000	24,100
Nebraska	3,200	3,000	3,200
New Mexico	136,625	154,000	135,875
Oklahoma	470,350	460,000	470,150
Texas	2,663,550	2,260,000	2,520,975
Dist. 1 (Southwest)	30,800	.....	29,800
Dist. 2 (Southwest)	150,950	.....	143,425
Dist. 4 (Southwest)	235,250	.....	226,075
Dist. 3 (Gulf Coast)	454,625	.....	438,775
Dist. 5 (Eastern)	44,075	.....	41,925
Dist. 6 (Eastern)	104,250	.....	99,525
East Texas field	305,400	.....	283,550
Dist. 7-C (West)	66,450	.....	62,800
Dist. 8 (West)	948,700	.....	875,425
Dist. 7-B (W. Central)	75,150	.....	73,125
Dist. 9 (N. Central)	156,500	.....	154,725
Dist. 10 (Panhandle)	91,400	.....	91,825
Utah	3,500	4,000	3,400
Wyoming	163,900	170,000	161,100
Total United States	*5,826,025	5,540,000	5,681,925
Change from previous week, up	144,100		
Canada	65,985	.....	62,945

Total U. S. production January 1-September 9 †1,317,651,755 bbl.

Same period last year (crude plus cond.) ..... 1,278,465,080 bbl.

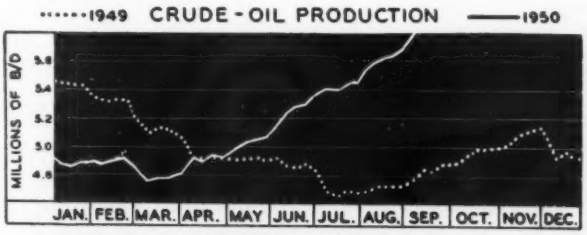
*Not including 97,150 bbl. condensate. †Including 24,519,005 bbl. condensate.

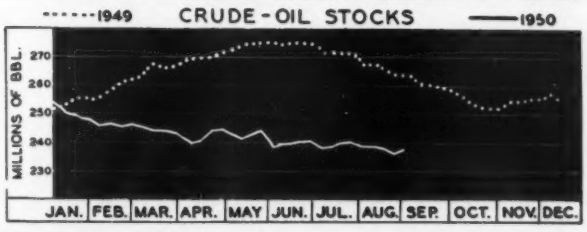
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

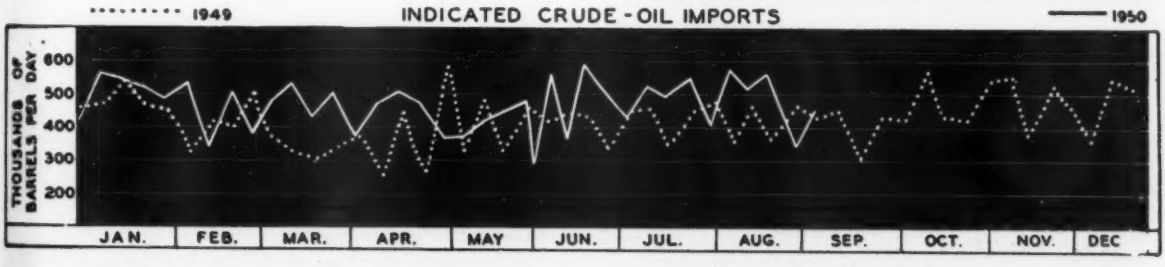
(Thousands of barrels)

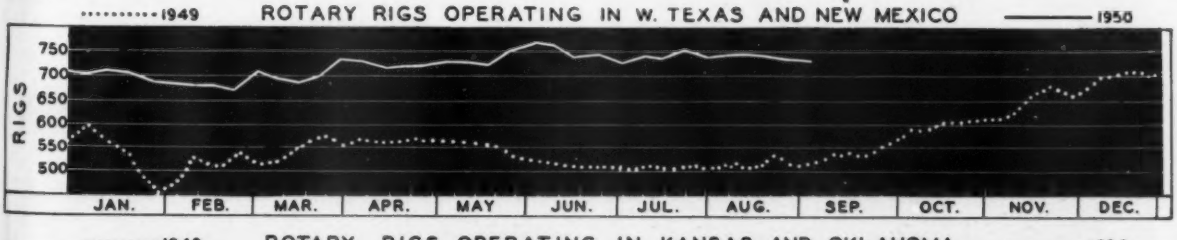
	Sept. 2, 1950	Aug. 26, 1950	Sept. 3, 1949
Pennsylvania Grade	2,554	2,604	3,393
Other Appalachian	1,353	1,293	2,124
Illinois, Indiana, Michigan	9,662	9,200	13,292
Arkansas	2,900	2,753	2,769
Louisiana	14,609	14,887	15,269
North	3,173	3,092	3,812
Gulf	11,436	11,795	11,457
Mississippi	2,485	2,317	2,752
New Mexico	5,908	6,111	7,590
Oklahoma and Kansas	33,501	33,650	39,046
Texas	115,937	114,053	121,223
East Texas	14,844	14,685	16,966
West Texas	44,207	42,962	48,130
Texas Gulf	28,912	28,040	28,968
Other Texas	27,974	28,366	27,159
Rocky Mountain	10,843	11,317	14,019
California	32,529	32,455	35,833
Foreign	5,825	6,294	7,303
Total	238,106	236,934	264,613

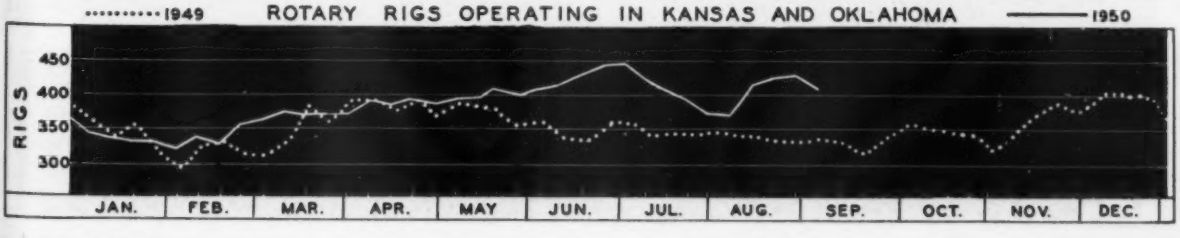
*Bureau of Mines.









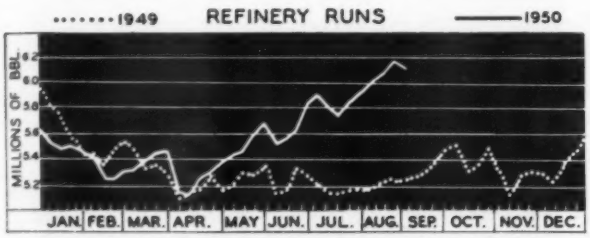


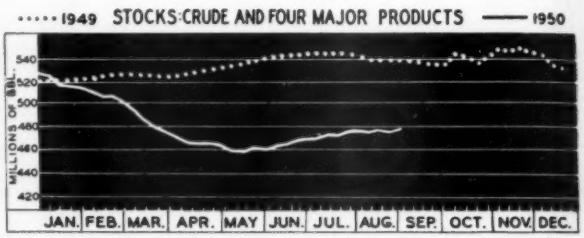
A.P.I. REFINERY REPORT, SEPTEMBER 2

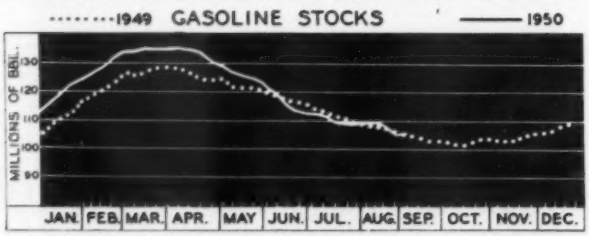
(Thousands of barrels)

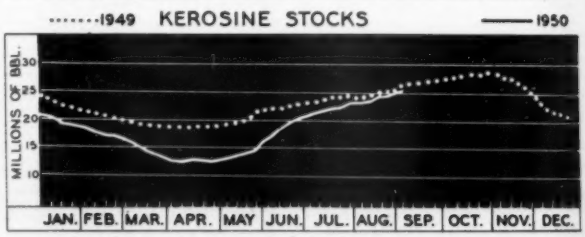
District—	Daily avg. crude runs	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, September 1949				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	988	397.3	34.6	206.4	216.3	24,946	9,089	18,610	11,131	777	319.8	25.4	172.3	176.9
Appalachian:														
District 1	110	48.9	5.9	13.1	10.3	2,378	432	678	400	98	46.9	5.0	13.2	10.0
District 2	70	38.1	3.1	5.9	13.4	1,060	127	172	233	67	35.1	4.1	7.2	13.6
Ind., Ill., Ky.	1,033	555.3	69.8	139.0	153.4	22,081	5,425	11,770	4,397	925	504.7	57.6	126.8	142.0
Okla., Kans., Mo.	525	291.6	8.9	110.6	62.6	10,324	1,326	6,979	1,296	418	241.6	14.4	82.1	60.9
Inland Texas	212	137.3	10.3	32.7	34.3	3,082	545	1,461	828	214	140.5	10.4	27.9	42.4
Texas Gulf Coast	1,458	640.6	117.0	328.9	245.7	15,830	4,137	10,910	5,231	1,325	606.1	81.4	282.0	233.8
La. Gulf Coast	505	235.4	67.3	106.2	59.7	6,095	2,784	3,804	2,028	456	220.8	47.2	106.3	60.8
N. La. and Ark.	60	23.6	5.4	14.1	4.7	2,431	448	664	278	73	30.9	6.3	10.6	15.0
Rocky Mountain:														
New Mexico	14	7.4	.4	2.4	3.4	96	25	48	39	10	5.8	.2	1.7	2.6
Other Rocky Mtn.	216	93.1	4.4	39.6	37.7	3,419	512	2,018	841	194	89.9	5.7	34.9	33.6
California	918	413.0	2.9	119.0	332.6	13,821	820	12,065	14,735	870	375.1	12.1	136.6	318.4
September 2, 1950	6,109	2,881.6	330.0	1,117.9	1,174.1	105,563	25,670	69,179	41,437	5,427	2,617.2	269.8	1,001.6	1,110.0
August 26, 1950	6,197	2,894.7	324.6	1,079.8	1,220.4	105,793	24,829	65,841	41,697	.....	.....	.....	.....	.....
September 3, 1949	5,233	2,555.9	222.9	960.6	1,032.3	104,834	25,560	76,430	67,997	.....	.....	.....	.....	.....

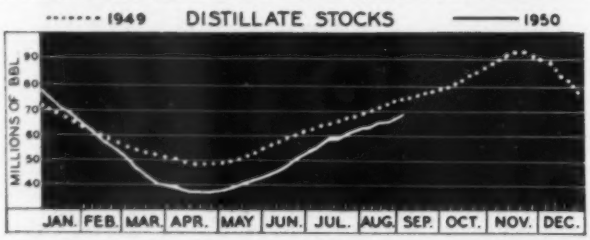
*At refineries including natural blended. †Finished and unfinished.

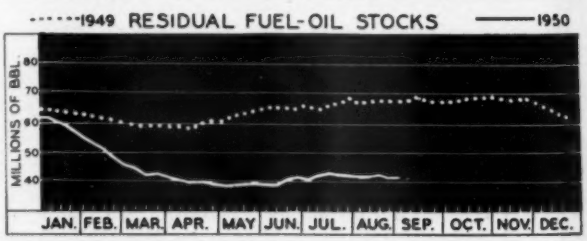


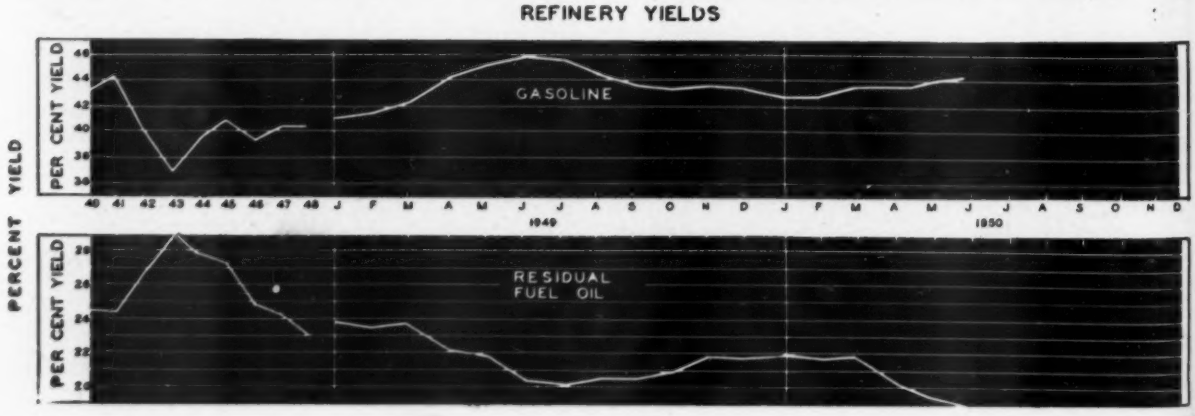












CRUDE PRICES

GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Okla-homa, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.69	....	....	....
19-19.9	1.77	....	....	....
20-20.9	1.85	$2.25	....	$2.12
21-21.9	1.93	2.27	....	2.14
22-22.9	2.00	2.29	....	2.16
23-23.9	2.08	2.31	....	2.18
24-24.9	2.15	2.33	$2.56	2.20
25-25.9	2.23	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	4.00
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°, †35° and above.

CONTINUING heavy demand for residual fuel in the industrial areas of the East Coast has been absorbing heavy-fuel imports as well as local and Gulf Coast production. Gulf-East Coast stocks have increased less than 700,000 bbl. since the middle of July. Little material has been offered on the Gulf at prices less than 10 cents over the low.

The increasing tightness of the heavy-fuel market resulted in an increase of 10 cents in the posting of a large independent in New York Harbor. Major suppliers continued postings of $2.15 per barrel, but at the end of the week one major company was reported to be in the market as a buyer.

The increase in Gulf Coast cargo posting for No. 2 fuel by one supplier can have little effect on the market until some balance is established between Gulf Coast and New York Harbor prices. If Gulf prices continue their general upward trend and tanker rates remain at present high level, barge prices on the New York Harbor market will have to move up from the current postings of 8.5 cents a gallon.

Natural-gasoline prices on the Group 3 and North Texas markets gained another .25 cent a gallon. Current postings for Grade 26-70 are 6.125 cents Group 3 and 5.625 cents for North Texas. Peak demands for natural extend beyond the normal motoring season since the gradual reduction in motor-fuel consumption is offset by a higher percentage of blending, made possible by cooler weather.

Market demand for refinery-produced gasoline and prices quoted for this gasoline remain firm, but the normal seasonal effects are showing up in reduced quotations for recycle gasoline.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotation of leading suppliers as of September 11, 1950. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10⅜-10½	12.5-12.75	10¾-11½
Premium gasoline, 86-88 octane	11¼-11½	13.5-13.75	11½-12
42-44 w.w. kerosine	8⅞-9	9.5	8½-8⅝
No. 2 straw fuel oil	8¼-8¼	8.5	7½-7¾
No. 6 residual	$1.65-1.75	$2.15-2.25	$1.80-1.85

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	6⅛	5⅝	5⅞
Grade 18-55	7.35	6.85	7.10

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	12.5
750 vis., No. 3-4 neutral	14.75
2,000 No. 5-6 neutral	16.5

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	25-27
200 vis., No. 3 neutral, 0-10 pp.	15.5-17.5

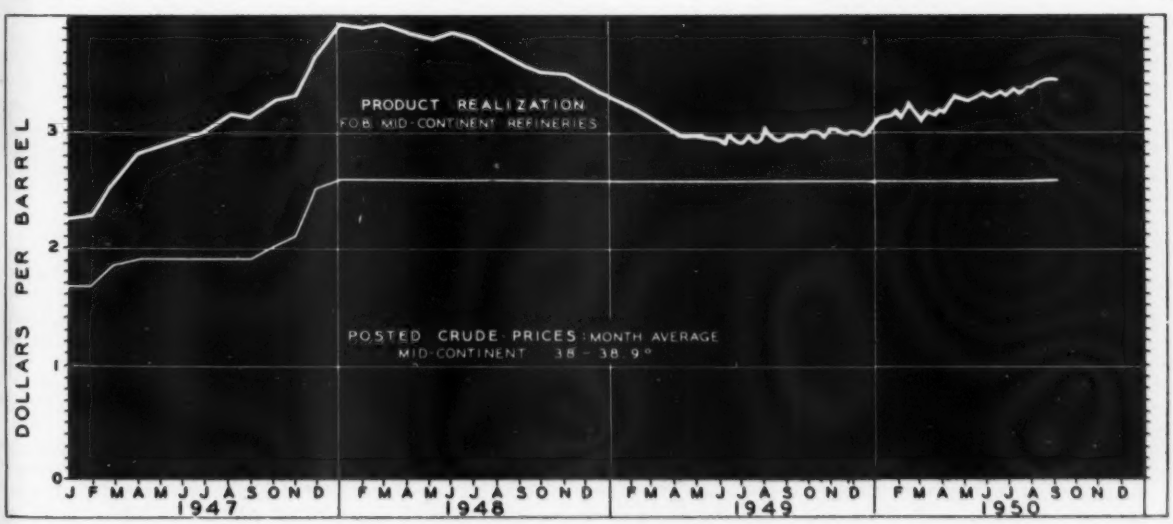
Western Pennsylvania

145-155 vis., 10 p.t. bright stock	28
180 vis., 0 p.t. neutral	29

WAX

Mid-Continent

132-134 A.M.P.	4.50


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
POSTED CRUDE PRICES 1 MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
DOLLARS PER BARREL
0
1
2
3
J F M A M J J A S O N D
1947
F M A M J J A S O N D
1948
F M A M J J A S O N D
1949
F M A M J J A S O N D
1950

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.47 for week ended September 2, $3.48 for previous week, and $2.99 for September 1949.

EQUIPMENT MEN ... in the News

Fox Named Publicity Head Of General Motors Diesel

William Fox has been appointed publicity manager of the Detroit Diesel Engine Division of General Motors Corp., according to an announcement made by J. W. Brown, advertising manager.

WILLIAM FOX

In his new capacity, Fox will conduct field photographic tours and issue product news releases on diesel engines manufactured by the division. Fox joined Detroit Diesel in 1942 and has been in the advertising department since 1947. He attended University of Michigan and has had extensive sales and advertising experience with Detroit manufacturers and advertising agencies.

Filtrol's New Plant to Have Broad Facilities

Wright W. Gary, president of Filtrol Corp., has announced that in addition to manufacturing an improved catalyst, the firm's new 3-million-dollar plant at Salt Lake City will be capable of manufacturing the full line of Filtrol products.

Filtrol also operates large plants in Mississippi and California, producing natural catalysts and a wide range of adsorbents. The Salt Lake plant, scheduled for operation early in January, will require an initial quota of operating personnel of 150 persons in direct plant operations. Most of this personnel will come from the Salt Lake area; however, certain specialists will be drawn from the Los Angeles plant.

B.O.F.E.C. Licensed to Make Cameron Products

A. G. Kirkin, sales director of British Oilfield Equipment Co., Ltd., has announced the licensing of his firm to manufacture and market in sterling areas, a range of products patented by Cameron Iron Works, Inc., Houston.

Cameron equipment to be manufactured and sold by British Oilfield Equipment includes: well-head assemblies, casing heads and hangers, tubing heads and hangers, forged-steel tees and crosses, chokes and flow wings, tubing packers, blowout preventers, flow-line valves, and hydraulic-operated gate valves. In addition to manufacturing and selling these products, the agreement between Cameron and British Oilfield Equipment provides for the marketing in sterling areas the balance of the Cameron line of oil-field equipment consisting of forged-steel lift-plug valves, Flex Seal mud valves, shear relief valves, and pressure gages and indicators.

The British firm will continue to manufacture and market its own line of drill collars, substitutes, pumping units, switchgear, kellys, drag bits, drive groups, scabbards, slush pumps, and generating sets.

Ankney Named H. C. Smith Wyoming Representative

Appointment of Jack Ankney as sales representative in Cody, Wyo., for H. C. Smith Oil Tool Co., has been announced by Ronald C. Smith, general sales manager.

JACK ANKNEY

Ankney has been actively engaged in sales work in Sussex and Glenrock fields wtih the new H. C. Smith two-cone and cross-section rock bits.

Three Get New Posts in G-E Industry Divisions

J. David Wright has been appointed assistant manager of General Electric Co.'s industry divisions at Schenectady, N. Y., it was announced recently by A. K. Bushman, the division's manager.

He will be replaced in his former position as manager of the company's industrial-engineering divisions by Frederic M. Roberts, Bushman said. Concurrently, Roberts announced that Leonid A. Umansky will assume the post of manager of engineering of the industrial-engineering divisions.

In his new capacity, Wright will assist in the supervision of the following divisions which comprise the application, service, and construction engineering group of the industry divisions: analytical, aviation engineering, central-station engineering, construction engineering, industrial engineering, marine engineering, service engineering, and transportation engineering.

Roberts will be responsible for the supervision of, and Umansky will have engineering responsibility for, the following divisions: chemical and petroleum, industrial power, machinery, materials-handling and testing equipment, consumer industries and municipal engineering, paper and textile, power electronics, steel mill, and mining.

Construction Started on New B. F. McDonald Plant

An architect's drawing of the new B. F. McDonald Co. plant at Los Angeles. The building, to occupy a 4-acre site, more than doubles space and facilities for the manufacture of safety equipment.

B. F. McDonald, founder of B. F. McDonald Co., manufacturer of safety equipment, has announced that construction has begun on a new office and manufacturing plant in Los Angeles, adjacent to the International Airport. The building will be constructed at a cost of approximately a quarter million dollars and will be completed early in December.

McDonald founded the safety equipment manufacturing firm in 1932 after serving for a number of years as safety engineer with the U. S. Bureau of Mines. His career in safety work, however, began in 1922, shortly after having joined the Bureau of Mines, at which time he headed one of four rescue teams in an attempt to save 47 trapped miners.

Zwerneman Buys Interest In Atlas Pipe, Inc.

Alvin (Dutch) Zwerneman, who recently resigned as vice president and general sales manager of Axelson Manufacturing Co., Los Angeles, has announced his acquisition of a substantial interest in Atlas Pipe, Inc., of Houston.

A. ZWERNEMAN

Zwerneman, who has been a familiar figure throughout the petroleum - equipment industry for more than a quarter century, will operate from the Atlas Pipe offices, located in the Esperson Building in Houston.

In addition to the sale of petroleum pipe, the Atlas organization will also represent Rasmussen Manufacturing Co., Hollydale, Calif., producers of ball-bearing swivel fittings for the petroleum, chemical, and allied industries; E. H. Edwards Co. of San Francisco, manufacturers of wire and wire rope; and Page Oil Tools, Inc., of Long Beach, producers of specialty items for the petroleum and petrochemical industries.

Warner Lewis Accounts Go to Charles Wheatley

Warner Lewis Co. of Tulsa has announced that it will transfer all jobbing and representation of a number of its accounts to Charles Wheatley Co. of Tulsa. The accounts include Viking Pump Co., Cedar Falls, Iowa; Ralph N. Brodie Co., Oakland, Calif.; Morrison Brothers Co., Dubuque, Iowa; Evertite Coupling Co., New York; Chicago Metal Hose Corp., Maywood, Ill.; Westco-Pomona Pump Co., St. Louis.

In addition to these accounts Warner Lewis is turning over all inventory of incidental lines that include hose, pressure gages, tin ware, buckets and all equipment pertaining to the bulk plant and service station part of the business. The decision to discontinue these jobbing accounts which the firm has represented since 1931, is its expanding manufacturing in connection with Excel-So water separators, filters, and calibrating tanks, for both domestic and military service.

Charles Wheatley Co. is at present representing Frank Wheatley Pump & Valve Co., Goodyear Mechanical Rubber Goods Co., Worthington V-Belt Co., Thornhill-Craver Co., Guston-Bacon Couplings, and Le Roi Engine Co. With the addition of the accounts taken over from Warner Lewis, Charles Wheatley is expanding its service and sales department. James Withers, formerly sales manager of Manning, Maxwell & Moore, together with six salesmen who are now covering the oil-field territories of Kansas, Oklahoma, western Arkansas, western Texas, and Louisiana, will be able adequately to service and represent the newly acquired accounts.

Eastman Forms New Foreign Export Firm

Formation of Eastman International Co., a new organization to handle foreign sales, service, and equipment of Eastman Oil Well Survey Co., was announced in Denver by H. John Eastman, president of the new firm. Eastman International will be exclusive agents for Eastman equipment world wide. The main office is in Denver, with district offices in Long Beach, New York City, and Houston. Eastman Oil Well Service Co., Ltd., of Calgary and Edmonton, Alta., Canada, which has long served the Canadian area, has been made a subsidiary of the newly formed organization.

DAVID NEILL

Officers of the company include Hal Benson, vice president, and Phyllis M. Freeland, secretary-treasurer. Together with Eastman and J. E. Treacy, managing director of the Canadian offices, they will comprise the board of directors. David P. Neill has been named general sales manager. Rudy von Glinski is assistant to the vice president. He has had a wide experience in the translating and writing of foreign languages which was gained while in foreign export work in South America, the Orient, and Europe. The new company plans to act as representatives for various lines of oil-field equipment for foreign export, and in assembling data on all types of materials.

Planning activities of Eastman International Co. are H. J. Eastman, Rudy von Glinski, and H. E. Benson.

A. H. Bost Returns to Military Service

Armon H. (Jack) Bost, vice president and general manager of Midwestern Engine & Equipment Co., Inc., Tulsa, recently announced that the United States Army had alerted him and that as of September 15 he would suspend his duties at that company and be inducted into military service.

A. H. BOST

Colonel Bost served 5½ years in World War II and has since been steadily and actively engaged in important peacetime reservist work.

Jack Bost, O. E. (Ted) Murray, and Jack Glandon were among the original organizers of Midwestern Engine & Equipment Co. in 1946, and subsequently have bought out all other major stockholders. The three-way partnership was formed to offer sales and service in the pipe-line and general construction fields throughout the Mid-Continent territory. For 4 years Midwestern has acted as national distributors for Owens-Corning and has stocked four regional warehouses with the high tensile-strength parallel-yarn reinforced Coromat, the latest development in the pipe-wrap field. In addition, the firm introduced the use of Kapco Rock Shield, a mastic composition board that protects pipe and pipe coating from rock damage.

Continental engines, Unit cranes and shovels, Barnes pumps, and a complete line of pipe-line and general contractors equipment also number among Midwestern lines. Ted Murray and Jack Glandon will continue normal operation of Midwestern during Bost's military absence. He will maintain his ownership and position in the company in anticipation of his return at a later date.

Selby Becomes Assistant To U. S. Steel Sales Head

A. Paul Selby has become assistant to the vice president in charge of sales, United States Steel Corp. of Delaware, it has been announced by David F. Austin, vice president-sales.

Selby was graduated from R. T. Crane Technical School and attended Lewis Institute. He was appointed assistant to vice president in charge of sales, Carnegie-Illinois Steel Corp., a United States Steel subsidiary, in 1938, assistant to general manager of sales in 1939, and in 1945, assistant general manager of sales, the position he now holds.

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WELL equipment. New and used spudders, rotaries, core drills, all sizes and types. Cable tools, drill pipe, bits, pipe. Fishing tools rented. Everything for well service. Pressey & Son, Pueblo, Colo.

FOR SALE: 300 Amp Westinghouse welding machine powered by 6-BK Waukesha engine. Completely overhauled. Less than 50% of new price. Melton Supply Company, Box 1360, Seminole, Oklahoma.

IDECO complete oil rig on sixteen wheel trailer for sale or lease. Terms. Tel.: Orchard 13514 or write E. D. Warren, 302 East Queen Street, Inglewood, Calif.

BARGAIN FOR QUICK SALE

Large Steam Rig Complete Ready to go. 14x14 Engine, 18" & 20" Pumps, 10,000' 4½ Drill Pipe, 136' Drk All 300 Ton Equipment. Everything Good Condition. **McDaniel & Beecherl Drlg. Co.**, 521 Republic Bank Bldg., Dallas, Texas, or Phone 3651, Odessa, Texas.

FOR SALE

9—230 H.P. Bessemer Type 10 Engines with compressors, Steel Buildings, Valves and Fittings complete for installation. Located Salem, Illinois Oilfield.

ENGLE PETROLEUM, INCORPORATED
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Telephone 5-5179

8" PIPE FOR SALE

Approximately 800 miles of 8"—29.02# line pipe being taken up. This pipe was used in a 650# Pressure Products Line. Pipe Subject to Prior Sale F.O.B. Pittsburgh District.

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16,500 ft. NEW 4" OD BOILER TUBING

9 gauge
20-24 foot random lengths
Electric Weld

Write — Wire — Phone

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2nd and Riverview (X-630)
Kansas City 18, Kansas
THatcher 9243

EQUIPMENT FOR SALE

FOR SALE: 10—10,000 gal. cap. ⅜-in. Shell ½ in. Heads Clean Horiz. Steel Storage Tanks f.o.b. Pittsburgh. Lestan Corp., Rosemont, Pa.

FOR SALE: New 100 ton Hydraulic, pipe, tube and shape bending press. $5000 FOB Astoria, Oregon. Orval Eaton, City Hall, Astoria, Oregon.

Several Army Surplus 4½" x 6" Gaso Duplex 1860 Pumps — two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

SALT WATER PIPE

60c ft. 5⅛" x 4 9/16"
100 lb. Test
Roll or Bolted Couplings—$1 up

GOOD-ALL MFG. CO.
Ogalala, Neb.

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FOR SALE: 36-L Bucyrus-Erie, excellent condition, 1947 Model, rubber mounted. D. E. Davis, Poneto, Indiana. Phone: Bluffton, Indiana, 972-2.

USED ROTARY AND CABLE TOOL DRILLING TOOLS, WIRE LINES. E. A. KELLY, BOX 661, OKLAHOMA CITY. PHONE 5-6407.

FOR SALE

Hydraulic Casing Pulling Units, Hydraulic Jacks, Casing Spiders, Rings & Slips. Also,
Skid Mounted Cementing Unit, Complete. Write or Call

OKLAHOMA MACHINE & SUPPLY CO.
Phone 780 Ada, Okla. P. O. Box 987

FOR SALE

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Milam Building, San Antonio, Texas

FOR SALE

50,000' 2⅜" OD 4# Good Used Lapweld Tubing 11½ V-Thread, Range 1 good for shallow well tubing or line pipe.

50,000' 2⅜" OD 4# Good Used Lapweld Tubing 10 V-Thread, New Threads, Collars and Protectors.

50,000' 3" OD x .125/.160" Wall New Seamless Steel Tubing 14' to 25' Lengths, PE.

30,000' 3¼" OD x .130/.160" Wall New Seamless Steel Tubing 14' to 25' Lengths, PE.

50,000' 3" (3½" OD) Standard Black 7.5# Fair Grade Used Lapweld PE Random Lengths.

16,000' 3" (3½" OD) Standard Black Good #1 Grade Used Lapweld T&C 20' Lengths Recessed Collars.

8,754'8" 3½" OD 9.2# New Seamless J-55 10 Round Thread Tubing Range 2. This material loaded in car for immediate delivery.

40,000' 4" OD x .130/.170" Wall New Seamless Steel Tubing 14' to 24' Lengths PE.

40,000' 4" Standard Black Lapweld Good Used Line Pipe, PE and T&C.

25,000' 5" OD x .438/.563" Wall 27# Average New Seamless Steel Pipe 14' to 30' Lengths PE.

1,250,000' 6" (6⅝" OD x .280" Wall) 18.97# 20' RML Used #1 and #2 Grade Lapweld, Cleaned, Beveled Ends, 30°. Available for inspection, delivery in 30 to 60 days.

10,000' 8" (8⅝" OD 22# & 24#) Good to Fair Grade Used Lapweld Random Mill Lengths.

3,500' 10¾" OD 28.04# Good to Fair Used Lapweld Pipe Random Mill Lengths.

10,000' 18" OD x .281" Wall New Electric Weld 40' Lengths, PE.

10,000' 24" OD x .312" Wall New Electric Weld 40' Lengths, PE.

NEW AND GOOD USED SEAMLESS AND LAPWELD CASING AND TUBING AVAILABLE IN ALL DESIRABLE SIZES FOR IMMEDIATE DELIVERY, SUBJECT TO PRIOR SALE.

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FOR SALE: Long wheelbase heavy duty tandem truck driven 12,000 miles. Ideal for drilling rig or heavy workover unit. Fred R. Holland, 7403 Bankhead Highway, Fort Worth, Texas.

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50,000 ft. 6⅝" OD 17.02 new Youngstown Lapweld, Range 1 Line Pipe. FOB rail point Wyoming. Wire inquiries.
Material subject to prior sale.

AMERICAN PIPE & SUPPLY CO.
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Reconditioned
Seamless Tubing

65,000 ft. 1⅞" O.D.
55,000 ft. 1½" O.D.
40,000 ft. 2" O.D.
30,000 ft. 3¼" O.D.
20,000 ft. 3½" O.D.
25,000 ft. 4" O.D.
45,000 ft. 5½" O.D.

Approximately 9 gauge wall.
Single or Double Random Lengths.

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12' Fractionating Columns

TOWERS—A-1 Condition
Immediate Delivery

One Stripper Column—12' I.D. x 66' tangent to tangent x ¾" thick shell and heads, ASME-API code constructed stress relieved and radiographed, 29 Carbon Steel trays and caps on 2' spacing, 100# @ 200° F., mounted on 12' I.D. x 9'4" high x ⅝" thick skirt.

Two Extractor Columns, 12'6" I.D. x 85'5" tangent to tangent x 1" thick shell x ⅝" thick hemispherical heads, 40 Carbon Steel trays on 2' spacing, 150# @ 300° F., radiographed, mounted on 12'6" I.D. x 16'7" high skirt.

Write, Wire, Phone for Listings

DULIEN STEEL PRODUCTS, INC.
of Washington
P. O. BOX 667
COTTON VALLEY, LA.
PHONE COTTON VALLEY 26

EQUIPMENT FOR SALE

AVAILABLE for sale and immediate shipment #1 T & C 2" line pipe, seamless and lapweld casing, tanks. Call or write Edco Pipe & Supply Company, Box 565, Drumright, Oklahoma.

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Gaso, Byron Jackson, Aurora, Wayne Lombard & Hale Fire Pumps with Engines. 1½ to 25 KW Generator Sets or Light Plants, Engines, Suction Hose, Fire Hose, Victaulic Couplings & Etc. Write for listing. H A. McCarthy, 310 Thompson Bldg., Phone 5-3296, Tulsa, Oklahoma.

FOR SALE: 4—300 WP Dome Locomotive-Type boilers; one steam sand reel, 12,000' Cap.; one boiler feed system complete.—R. W. Noble, Phone 601, Box 866, Jennings, La.

NATIONAL "50" Compound Double Drum Rig 126' Cantilever L. C. Moore Mast 10' substructure. 6,000' 4" drill pipe. This rig complete and in excellent condition. P. O. Box 205, Sta. B, Bakersfield, California.

CASING, TUBING, LINE PIPE FOR SALE: Good used lap weld 2" to 10¾". Reasonable prices. Everything in cable drilling tools, rigs, belts, drilling engines, surplus wire lines. TRI STATE TOOL AND SUPPLY CO., Box 827, Parkersburg, W. Va. Phone 7-5121.

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7500' 2" xx seamless pipe approx. 400' new 16" bell & spigot 150# cast iron pipe—at mill price.

BOX 574, Tulsa, Oklahoma.

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Two used ten-thousand barrel welded tanks, knocked down, match marked, ⅜" bottoms.

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2 New Hydraulic Shot Hole Drill Rigs at Special Price. Capacity, 400' of 3" hole with 2⅜" drill pipe comprising 1½ ton Ford truck, 25' 6" tubular mast with double acting hydraulic rams to provide 10' continuous non-chucking stroke, hydraulic operated winch, hydraulic powered rotary table, hydraulic rotary table push down, G-D 4 x 5 mud pump, swivel, 49 sections of 2⅜" drill pipe 10' long and complete accessory equipment.
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(Available Immediate Delivery)

2—118,000 bbl. Steel Cone Roof
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3— 37,500 bbl. Steel Cone Roof
3— 25,000 bbl. Steel Cone Roof
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11— 11,700 bbl. Steel Cone Roof

Smaller additional tanks, 850 bbl. to 7,800 bbl. inclusive available same location.

All tanks now standing Texas Company's refinery site, Dallas, Texas, suitable for re-erection.

Additional information regarding prices, specifications, etc., available upon request.

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Ph. 2-9128, Tulsa, Okla.

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FOR SALE: 2—36-L Bucyrus Erie Spudders complete with cable tools. THE SANDY SUPPLY COMPANY, WOOSTER, OHIO.

FOR SALE

4—Fairbanks-Morse ZC-346 Pumping Engines complete with Type J Clutch and Sheaves. Two Units practically new and all in good running condition—Price $3750 for four engines or $1000 each. Available for inspection—Lamesa, Texas. Write, wire or call: **McMillian and Peterson, P. O. Box 1787, Phone 1471, Midland, Texas.**

FOR SALE

9—Type K New Double Reduction Pumping Units suitable for 1000' wells with 2" tubing. Price $375.00 each, less counter weights, foundation bolts and motor. FOB shop.

OKLAHOMA MACHINE & SUPPLY CO.
P.O. Box 997, Ada, Okla. Tele. 780

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10,000 feet of New 2½" upset J-55 Tubing—$1.40 per foot, FOB Laurel, Miss.

4,800 feet of New 5½" OD Seamless Casing—$2.75 per foot, FOB Laurel, Miss.

Phone 5353, Laurel, Mississippi

200,000 LBS. OF FOAMITE

Mfg. by Pyrene Co. . .Excellent condition. Field lab tested. Sealed in original tin carton. Wgt. 47 lbs. per can.

MAKE US AN OFFER
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6⅝" O.D. 18.97# USED PIPE

1,000,000 feet excellent grade with torch beveled ends 30° lapweld, 20' random lengths. Available for inspection and immediate shipment in carload quantities. For details contact at once by wire or phone collect.

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CABLE TOOL GASING SPEARS SURPLUS

15—IDECO 4 slip Fox Trip for 8 inch I.D. Casing

Brand New—with pulldown Pin Size 2 x 3-7 A.P.I.

PRICE $100 EACH F.O.B. LOS ANGELES

This is more than one-third of factory price—cheaper than renting.

Drilling & Mining Equipment Co.
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River Oaks Business Property. 70-ft. frontage, corner lot on Westheimer with two-story tile stucco house adjoining Avalon Center. Ample parking facilities. Ideal office or commercial location for oil company or allied field. Price $42,500.

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Phone—KE-1325

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WANTED TO BUY: 16" O.D. and 10" O.D. 8 or 10 thd. 13⅜" and 9⅝" 8 thread collars, new or used. Box 574, Tulsa, Okla.

WANTED: 28 or 36-L with casing strut or similar machine without tools. Must be in good shape and reasonable. Ralph Stubble, Chatham, Ontario.

WANT several wood tanks suitable for water separators. Prefer 12' to 18' height. Write: Williams Oil Co., 915 South Main, Ottawa, Kansas.

WANTED TO BUY: All steel spudder of 2000 to 4000 foot capacity, with or without tools. Give cash price and location. Donald McCort, Atlas Star Route, Barnesville, Ohio.

WANTED: L.P.G. Code Tanks 150 to 400 bbl. capacity. Wood River Oil & Refining Co., Inc., 321 W. Douglas, Wichita, Kansas, Telephone 5-5674.

WANT two modern type gas engines, 40 to 80 hp. range. Generator or gas powered generator set. 220 or 440 a.c. in 20 to 60 kw. range. Condition, location, and price, please. Williams Oil Co., 915 South Main, Ottawa, Kansas.

WANTED: USED 4½" DRILL PIPE
Box D-606, The Oil and Gas Journal, Tulsa Oklahoma.

WANTED: New or prime used seamless A-53 or A-106 pipe in 2", 3", and 4", standard, extra heavy, and double extra heavy. Horwitz Pipe & Steel Co., 415 S. Western, Okla. City, Okla.

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Complete 5000-6000 Barrel Refinery for shipment to Canada.

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Pipe Threading Machines
6", 8" and 12"

Landis or Bignall & Keeler with Landis Heads. Machines must be in good working order with individual motor drives. Give complete description including make, model and serial numbers, width of dies or chasers, motor specifications and prices.

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EXPERIENCED Geophysicist with geological background for review and interpretation of seismic data. State age, training, experience. Reply Box D-654, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer or Geologist with experience in evaluation and subsurface studies in Gulf Coast wanted by sound independent. Age 30-45. In application state salary expected and enclose college transcript. Box D-631, The Oil and Gas Journal, Tulsa, Oklahoma.

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Permanent position on the process staff of an internationally known New York engineering firm for a top flight technical graduate with approximately five years experience in petroleum or petrochemical field. Candidate should be capable of assuming responsibility for process design. Salary high and commensurate with experience. All replies in confidence.

Box D-677, The Oil and Gas Journal, Tulsa, Oklahoma

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FOREIGN and Domestic Oil Employment Directory covering the oil industry, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla.

SALES ENGINEERS
OPERATIONS SUPERVISORS
PERFORATOR OPERATORS

Only Experienced Men Need Apply.

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Instrument Repairman, First Class to work in Celanese Chemical Plant in the Corpus Christi, Texas, area. Permanent job at $2.10 per hour. Must be capable of repairing, overhauling, installing, and doing general trouble shooting on all types of Automatic Control Systems; such as Taylor, Foxboro, Brown, Leeds-Northrup, Fisher, and Westcotts. Must be acquainted with the general operations of towers, furnaces, boiler equipment, and be qualified to work from Engineering Blue Prints and Specifications.

In letter, applicant should give his complete work history with description of duties performed, equipment worked on, physical description, age, and number of dependents.

Address replies to
CELANESE CORPORATION OF AMERICA
Attention: Employment Manager,
P. O. Box 148, Bishop, Texas

SEISMOLOGIST

Experience, five years or more, required for Seismic Supervision and Interpretation in Head Office of Major Oil Company operating in Saskatchewan. Salary commensurate with experience and ability.

All replies confidential.

Apply in writing to Chief Geophysicist,

SOHIO PETROLEUM COMPANY
1822 Albert St., REGINA, SASK.

NEW SMALL OIL REFINERY IN BOLIVIA, S. A., REQUIRES EXPERIENCED PERSONNEL AS FOLLOWS FOR ONE YEAR WITH OPPORTUNITY RENEWAL CONTRACT. SALARIES PAID IN U. S. FUNDS:

CHIEF CHEMIST: Graduate chemical engineer minimum three to five years' refinery experience including control laboratory work and technical service in plant operations especially light ends and aviation gasoline blending.

CHIEF OPERATOR: Minimum five years' all-round refinery experience particularly with precise fractionation including operating foreman experience; capable directing refinery utility services. Graduate chemical engineer preferred.

OPERATORS: Experienced shift operators capable supervising plant and utilities operations especially precise fractionation; general over-all refinery experience necessary.

OCTANE TESTER: Thoroughly experienced routine methods and maintenance on aviation gasoline knock-testing engine.

INSTRUMENT MAN: Thoroughly experienced capable assuming responsibility of instrument department.

Write: Box D-665
The Oil and Gas Journal,
Tulsa, Oklahoma

HELP WANTED

EXPERIENCED Geophysicist with geological background to review, interpret seismic data. Extensive knowledge of Gulf Coast area. Permanent location in Houston. State age, training, experience. Salary commensurate with experience and general ability. Reply Box D-651, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEERS, Executives, Technical Men. Salaried positions — $3600 to $30,000. This confidential service for outstanding men who desire a change of connection, will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 1204 Berger Bldg., Pittsburgh 19, Pa.

DIAMOND DRILLER with experience in oil well diamond core work for sales and service position with reputable oil field service company. Man with sales experience preferred. Give full particulars and salary expected. Write Box D-671, The Oil and Gas Journal, Tulsa, Oklahoma.

ASSISTANT PIPELINE SUP'T.

An American oil company operating in South America requires on its regular staff a man thoroughly experienced in all phases of White Products Pipeline operations.

Write giving age, marital status, education, and details of experience. Communications will be held in strict confidence.

Box 308-K
Radio City Station
New York 19, New York

WANTED
Drilling Superintendent

$850.00 per month and new six-room bungalow. Applicant must be qualified for West Texas area.

Submit qualifications including experience and education. All replies will be treated confidentially. (Our employes know of this advertisement.)

Write Box C-645,
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Tulsa, Oklahoma

Maintenance Mechanic, First Class for Maintenance Repair, overhaul, and trouble shooting on 400 to 1,000 H.P. 2 and 4-cycle Clark, Worthington, Ingersoll-Rand, Steam and Gas Engines, Turbines, Pumps, Gear Boxes and Reduction Gears. In Celanese Chemical Plant in the Corpus Christi, Texas, area. Permanent job at a rate of $2.10 per hour. Experience desired. Selected applicant will be notified to report for personal interview and a physical examination.

In letter, applicant should give his complete work history with description of duties performed, equipment worked on, physical description, age, and number of dependents.

Address replies to
CELANESE CORPORATION OF AMERICA
Attention: Employment Manager,
P. O. Box 148, Bishop, Texas

ESTIMATOR

Experienced ENGINEER familiar with Oil Refinery design and capable of estimating process equipment from flow diagrams.

Give full information, experience record and salary expected.

ARTHUR G. McKEE & CO.
2300 CHESTER AVE.
CLEVELAND 1, OHIO

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Excellent opportunity in internationally known Oil Refinery Company for graduate engineer with heavy experience in design & development. Must be familiar with ASME and API Codes. Knowledge of vessel fabricator's shop practices and metallurgy. Attractive salary, including Pension Plan and other Employee Benefits. Write in strict confidence details of experience and education to

Box D-678, The Oil and Gas Journal, Tulsa, Oklahoma

SITUATIONS WANTED

DRILLING Contractor operating in West Texas and New Mexico desires to contact small or medium-sized independent oil company who needs an operating manager. Personal interview desired. Twenty years experience in all phases of the oil industry. Address replies to Box D-644, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED GEOLOGIST-GEOPHYSICIST with thirteen years' service company work United States and Venezuela, including electrical logging, radioactivity logging, dipmeter, side-wall sampling, gun perforating, jet perforating, mud logging, mud control, cuttings and core analysis, etc. Last few years largely administrative and sales. Education includes all academic work for Ph.D. degree. Thirty-five years old, married, two children. Prefer administrative, sales, or combination position with aggressive service company or technical position with major oil company requiring extensive knowledge of any or all of above services, domestic or foreign. Excellent references. Desire personal interview. Box D-658, The Oil and Gas Journal, Tulsa, Oklahoma.

MATERIALS: Refining and Production Materials Man Experienced in Control, Auditing, Inventory, Lease Mapping, and Purchasing. Can furnish best of references. Age 35. Box D-663, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No 131, Ph. No. 131, Hobbs, New Mexico.

CHEMICAL ENGINEER — Operations Superintendent, Project Engineer. Twenty years' experience operation, maintenance, construction, engineering. All types of refineries, gasoline plants, chemical plants. Employed. Box D-659, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM ENGINEER-PRODUCTION SUPERINTENDENT. Experienced drilling, production, and geology in Kansas and Rocky Mountains. Ten years superintendent sales and operations major technical service company. Three years production superintendent independent producer and refiner. Experienced supervision and administration complete drilling and producing programs with excellent record for maximum results at minimum cost. Box D-679, The Oil and Gas Journal, Tulsa, Oklahoma.

HIGHLY CAPABLE contact man with good education, personality, and experience desires position with reputable drilling contractor or sales organization. Salary and commission. Well known in Mid-Continent area. Available on due notice. Address Box D-672, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

AVAILABLE GEOPHYSICAL SUPERVISOR. Experienced and qualified. Box D-676, The Oil and Gas Journal, Tulsa, Oklahoma.

EXTENSIVE experience in management and operation of oil refineries. Desire connection with small company. Write Box D-673, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE GEOLOGIST: Age 28, two degrees, three years' experience, major company, desires position in geological, scouting or land department of progressive company. Box D-675, The Oil and Gas Journal, Tulsa, Oklahoma.

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TEN thousand acres leases on axis of former U.S. Petroleum Reserve, Rocky Mountain Region. Oil seeps from untested Madison, Devonian and Ordovician formations. Will make attractive deal. Box D-627, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: New 120 acre, 10 year oil and gas lease, Jesse Amason Survey, Shelby County, Texas. Good buy. $10 per acre. Write for information. C. A. Parker, Office Polley Hotel, Center, Texas.

CAN furnish new 5½" 14½# ss casing for interest in drilling well. Box 574, Tulsa, Oklahoma.

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Producing and Nonproducing
Bought and Sold—Any Area
Inquiries Invited

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Leases and Royalties
ALBERTA LEASEHOLDS
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Calgary, Alberta, Canada

WANTED

WANTED: SURPLUS Chemicals, Oils, Waxes, Solvents, Wastes and Residues of all kinds. Chemical Service Corporation, 98-06 Beaver St., New York 5, N. Y.

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MANUFACTURERS Representative covering Major Oil Companies New York Area seeks additional line, Centrifugal Pumps, Oil Field Engines or Electric Motors. Maintains Office, Warehouse and Shop. Box D-CL, The Oil and Gas Journal, 415 Lexington Avenue, New York.

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SURVEY SERVICE
The next well you drill will be a producer, if, you use the most unique service of all times, an immediate decision rendered. A demonstration will convince the mind of any man. The gamble is too great, you cannot afford to go without it. Box D-664, The Oil and Gas Journal, Tulsa, Oklahoma.

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Complete information on oil and gas possibilities in Nevada. Up-to-date lease maps.
Filing service. Daily and weekly filing and development information. Experienced geological consultants.
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San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

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Millions of acres now leased by world's major companies, with huge drilling play in prospect. For booklet describing Montana geology and oil development, write Landowners Royalty Company, Box 1225, Great Falls, Montana.

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Phone R-6159

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Banknote Printing Co. 130
Barco Manufacturing Company 44
Baroid Sales Division, National Lead Company 39
Barton Instrument Corporation 139
Beech Aircraft Corp. 11
Bethlehem Supply Co. 1
Big 3 Welding Equipment Co. 163
Bovaird Supply Co., The 42
Boyd Co., Clarence L. 143
Boyles Galvanizing Company 168
Brown & Root, Inc. 2
Cameron Iron Works, Inc. 141
Cardwell Mfg. Co., Inc. 96, 97
Cast Iron Pipe Research Association, The 151
Chicago & Southern Air Lines 146
Chiksan Company 132
Cities Service Oil Co. 151
Clark Bros. Well Servicing Co. 159
Classified Advertising 178, 179, 180, 181
Cleveland Trencher Company, The 142
Connelly, Inc. 152
Cooper-Bessemer Corp., The 103
Coppus Engineering Corp. 3
Crane Co. 7
Crose Manufacturing Co., Inc., M. J. 143
Crouse-Hinds Company 26, 27
Crutcher-Rolfs-Cummings 140
Cummins Engine Co., Inc. 24
Curtin & Co., Inc., W. H. 150
Dallas Manufacturing & Sales Co. 159
Dallas Tank Company, Inc. 50
Darling Valve and Mfg. Co. 47
Davison Chemical Corp., The 16
Dean Brothers Pumps, Inc. 143
Dearborn Chemical Co. 79
Drilling & Service, Inc. 167
Ensign Carburetor Company 55
Ethyl Corporation 30, 31
First National Bank & Trust Co. of Tulsa, The 25
Flint Steel Corporation 170
Franks Mfg. Corp. ..... Front Cover
Fulton-Syiphon Division Robertshaw-Fulton Controls Co. 8
General American Transportation Corporation 91
General Electric Company 29, 120, 121
Geolograph Company, Inc., The 104
Glitsch & Sons, Inc., Fritz W. 124
Goodall Rubber Company 134
Goodrich Chemical Company, B. F. (Hycar) 82
Grancell, I. H. 149
Grinnell Company, Inc. 52
Guiberson Corporation 32
Gunite Concrete & Construction Co. 152
Halliburton Oil Well Cementing Co. ..... Inside Front Cover
Harper Company, H. M. 93
Hawthorne, Inc., Herb J. 158
Hazard Wire Rope Division of American Chain & Cable Co., Inc. ..... Inside Back Cover
Hughes Tool Co. ..... Back Cover
International Cementers, Inc. 89
Jones & Laughlin Steel Corp. 23
Jones & Laughlin Supply Co. 21
Jones Company, The S. M. 10
Kelley Company, Ben F. 163
Kellogg Co., The M. W. 17, 18
Kinzbach Tool Co., Inc. 104
Knight Manufacturing & Supply Co. 108
Lane-Wells Company 56
Larkin Packer Company, Inc. 160
Latex Construction Company 140
Layne & Bowler, Inc. 20
LeBus Rotary Tool Works, Inc. 145
Leeds & Northrup Co. 5
Le Roi Company 51
Linea Aeropostal Venezolana 153
Lockett & Co., Ltd., A. M. 130
Lone Star Cement Corporation 58
Magnet Cove Barium Corp. 156
McGregor Working Barrel Company 159
Metals Disintegrating Co. 101
Minneapolis-Honeywell Regulator Co., Industrial Division 126, 127
Minneapolis-Moline 46
Monsanto Chemical Company 19
Moore Corporation, Lee C. 94
Mutual Chemical Company of America 119
National Airoil Burner Co., The 152
National Supply Co., The 115, 116, 117, 118
Oil Center Tool Co. 144
Oil Industry Information Committee 33
Oil Well Mfg. Corp. 114
Oil Well Supply Co. 4
Onan & Sons, Inc., D. W. 145
Orbit Valve Company 111
Otis Pressure Control, Inc. 165
Paris Distributor, Inc., Henry H. 104
Parkersburg Machine Company 159
Parkersburg Rig & Reel Co. 9
Penberthy Injector Co. 142, 153
Penn Electric Switch Co. 166
Perrault Brothers 145
Petroleum Distributing Co. 150
Petroleum Rectifying Company 37
Plastelite Engineering Co. 123
Powers Regulator Co., The 146
Railway Express Agency, Air Express Division 53
Republic National Bank of Dallas 113
Republic Rubber Division of Lee Rubber & Tire Corp. 43
Republic Steel Corporation 40
Rockford Clutch Division of Borg-Warner Company 169
Rollway Bearing Co. 41
Ross-Martin Co. 150
Schlumberger Well Surveying Corp. 98
Security Engineering Co., Inc. 6
Seismograph Service Corp. 125
Shaffer Tool Works 136
Smith Oil Tool Co., H. C. 148
Snap-On Tools Corporation 54
Southern Mill & Mfg. Co. 162
Spang-Chalfant Division of The National Supply Co. 116, 117
Spicer Mfg., Div. of Dana Corp. 28
Standard Oil of Indiana 49
Standco Brake Lining Co. 150
Stanley & Co., Morgan 157
Tapecoat Company, The 142
Thomas Flexible Coupling Co. 122
Thompson Tool Co. 171
Thornhill-Craver Co. 77
Trans-Texas Airways 145
Tulsa Crating Co. 153
Twin Disc Clutch Co. 36
Union Carbide and Carbon Corporation, Bakelite Division 45
United States Rubber Company 38
U. S. Steel Corp. Subsidiaries 4, 154
United States Treasury Department 14
Unit Rig & Equipment Co. 34
Universal Atlas Cement Co. 154
Venezuelan Airline, The 153
Vick & Sons, E. W. 150
Viking Pump Co. 145
Wagner Electric Corporation 22
Wells-Roberts Hotel 150
Westinghouse Electric Corp. 12, 13
Wood's Sons Co., T. B. 149
Wright Chemical Corporation 130
Wyodak Chemical Division of the Federal Foundry Supply Company, The 15
Youngstown Sheet and Tube Company 75
Zink Company, John 107
Zenolite Company 139

LEGAL

Sealed bids for oil and gas mining leases on certain trust lands on the Crow Indian Reservation, Big Horn County, State of Montana, will be received at the Office of the Superintendent, Crow Indian Agency, Crow Agency, Montana, up to 2:00 o'clock P.M., M. S. T., October 6, 1950. For further information, call or write L. C. Lippert, Superintendent, Crow Indian Agency, Crow Agency, Montana.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is herey given that the S½SE¼NW¼, NW¼SE¼, SW¼NE¼SE¼, sec. 11, T. 9 N., R. 79 W., 6th P.M., Colorado, 70 acres within the known geologic structure of the North McCallum field, will be offered for oil and gas leasing through competitive bidding at 1 p. m., Eastern Standard Time, September 20, 1950, when bids will be opened. Details of the lease offering, how and where to file bids and a description of the lands may be obtained by addressing an inquiry to the Manager of the Land Office, Denver, Colorado, or to this office. Marion Clawson, Director.

CALENDAR

September

Instrument Society of America, annual instrument conference and exhibit, Municipal Auditorium, Buffalo, N. Y., September 18-22.

American Gas Association, Accident-Prevention Committee, Wardman Park Hotel, Washington, D. C., September 18-19.

American Society of Mechanical Engineers, fall meeting, Hotel Sheraton, Worcester, Mass., September 19-21.

American Society of Mechanical Engineers, petroleum mechanical engineering conference, Roosevelt Hotel, New Orleans, September 24-28.

Ohio Mineral Industries Conference, sponsored by Ohio State University and Ohio Department of Natural Resources, Ohio Museum Auditorium, Columbus, September 25-26.

American Petroleum Institute, executive committee of board of directors meeting, Broadmoor Hotel, Colorado Springs, Colo., September 26.

October

Independent Petroleum Association of America, annual membership meeting, Jefferson Hotel, St. Louis, October 2-3.

American Gas Association, annual convention, Atlantic City, N. J., October 2-6.

Mid-Continent Oil and Gas Association, Texas division, Dallas, October 4-5.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, Mid-Continent meeting, Roosevelt Hotel, New Orleans, October 4-6.

Liquefied Petroleum Gas Association, northeastern and southeastern districts joint meeting, Ambassador Hotel, Atlantic City, October 5-6.

American Association of Oilwell Drilling Contractors, annual meeting, Mayo Hotel, Tulsa, October 9-10

National Association of Corrosion Engineers, south-central regional meeting, Rice Hotel, Houston, October 9-10.

Instrumentation for Process Industries, fifth annual symposium, Texas A. & M. College, College Station, Tex., October 11-13.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, West Coast meeting, Elks Club, Los Angeles, October 12-13.

Western Petroleum Refiners Association, regional meeting, Gladstone Hotel, Casper, Wyo., October 12-13.

NOMADS

Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.

Houston Nomads, second Monday of each month. Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month. Jonathan Club.

New York Nomads, golf party, September 19, Knoll Golf Club, Boonton Manor, N. J.; dinner meetings, October 2 and November 6, Louis Sherry's; annual Christmas dance, December 9, Hotel Pierre.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D.C. Notice is herey given that 41 acres within the known geologic structure of the West and Middle Red River oil and gas field, Tillman County, Oklahoma, will be offered for oil and gas leasing, through competitive bidding at 1 p. m., Eastern Standard Time, September 20, 1950, when bids will be opened. The details of the lease offering and how and where to file bids may be obtained by addressing an inquiry to the Regional Administrator, Region V, Albuquerque, New Mexico, or to this office. Marion Clawson, Director.

TABLE OF CONTENTS ON PAGE 59

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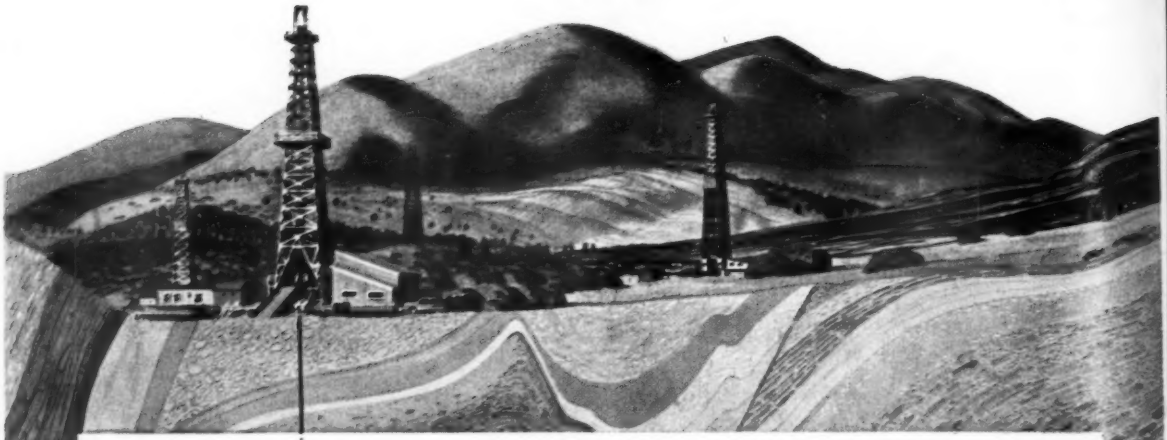

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